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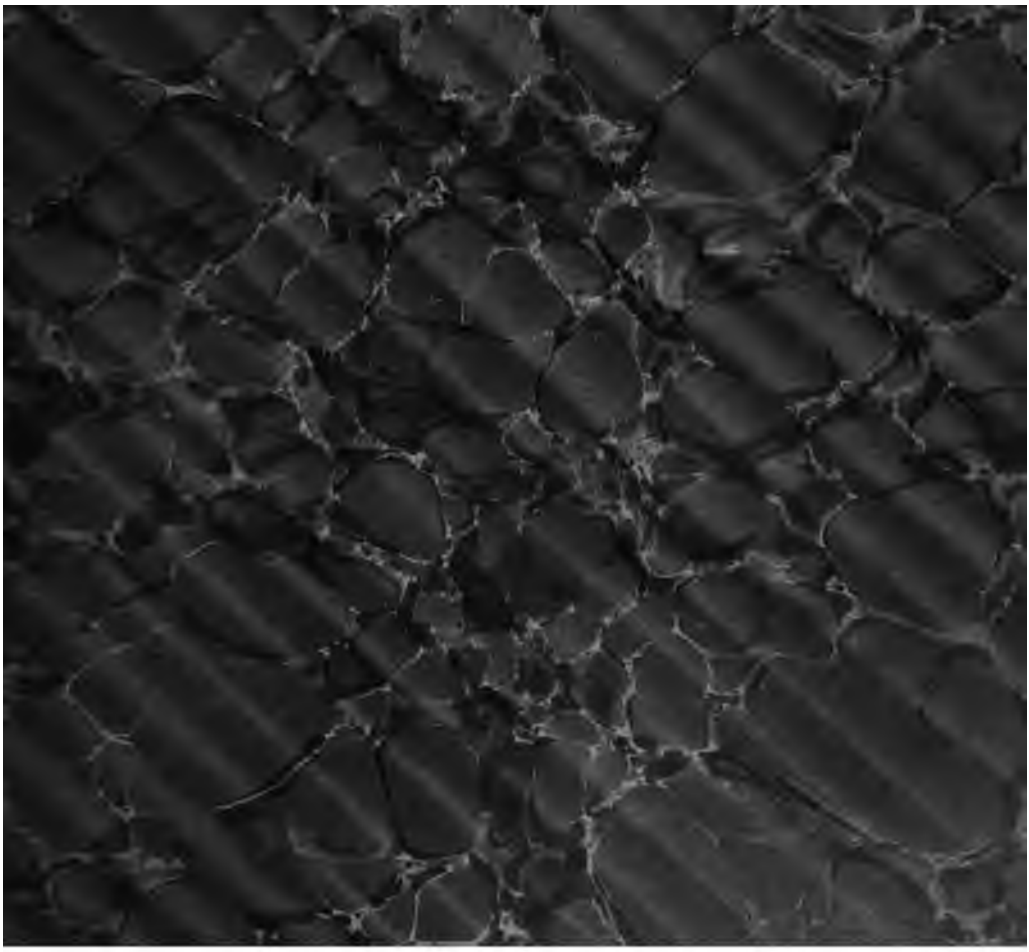

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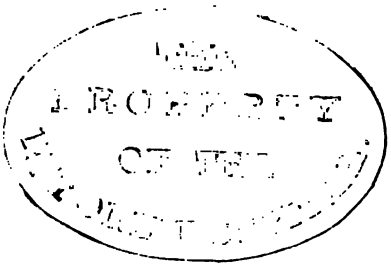

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BY THE PRESIDENT,

WILLIAM BOWMAN, LL.D., F.R.S.

GENTLEMEN AND DEAR COLLEAGUES,—

Many of those whom I have the happiness and honour of now addressing will be able to recall the proceedings of the fourth International Congress of Ophthalmology when it met in London nine years ago.

Our branch of practice on that occasion stood in a sort of isolation, separate from the rest of the body medical, moving in an orbit of its own. In that isolation it had during many years set an example, which was in due time to be followed by the General International Medical Congresses, of which the seventh is now

being held in our Metropolis. To-day we are obviously one among many members of the entire medical commonalty, and our work is admitted to be of the highest value, not only for its own sake, but for the beneficial influence which its aims and methods exercise over the whole field of Medicine.

In the brief interval since 1872, our President of that year, Professor Donders, has been called upon to occupy the still more honourable post of President of this General Congress, at Amsterdam. Let us greet him here once again, now in both characters, with the respect and affection which are so much his due. We owe it to him that our calling has been much advanced and elevated by the unfolding of many new truths, and the free presentation of them to us in lucid array, so that all men could turn them to account in the ordinary every-day round of practice, to the great benefit of ourselves and patients.

On the occasion to which allusion has been made, it was the College of Physicians which offered us accommodation, that ancient English Corporation of the Sixteenth Century, which, at its original institution, comprised upon its rolls almost all that was greatest among us in medical learning and practice, and which now, with characteristic liberality, is doing its utmost, with our other brethren, to further the success of the present world-wide Convention.

It now happens, however, that our Ophthalmological Section of this Congress is domiciled otherwise—viz., in the rooms of an illustrious Society, the time-honoured representative among us of the whole range of natural knowledge, for the promotion of which it was laboriously founded; largely, we may reflect with pleasure, by the co-operation of men of our own profession.

The circumstance is quite accidental, but it may serve to remind us of the deep and necessary connection of every Department of Medicine, our own in a marked degree, with the principles and subject-matter of the Natural Sciences in general. Man's body and mind have relations with the whole universe, and thus far extend also the aspects of those relations with which the healing art is concerned; which we study in man's interest, in order that we may understand how to modify or control them for his individual or general advantage.

As to these great modern International Congresses of the private men of various countries (of which it may perhaps be said that the present one is already proving itself the largest and most remarkable of any), this room may remind us how lofty, how noble have been the aims of some of the greatest intellects of the past; of whose achievements we find ourselves to be the fortunate inheritors. For it is Science itself, and nothing less, in the persons of a series of its eminent cultivators in many countries, working in an unselfish and open spirit, that has at length made such Congresses possible, and, in fact, has brought them about.

The Royal Society was founded, we may remember, about the time of the death of Harvey, and in the near radiance of that Baconian light, of which the token was that it must be, not dry and barren, but fruitful and beneficent for the use of man's estate. And above me, in your view, is the bodily presentment of the greatest of the Society's Presidents—of Newton, from whose genius and character have radiated, for us and for all succeeding ages, the beams of a potent and almost divine influence.

Let me, for a passing moment, strike a chord that will wake an echo in every breast, and give expression to the trust, that in our deliberations we may be guided by the simplicity of his pure love of truth, and of truth only: as well as by its correlative, that modest self-estimate, that humility of mind, which in him was the mark of a deep consciousness of his own individual littleness, and almost helpless-

ness, in presence of the dark problems of the unknown. "I know not what I may appear to the world," he is reported to have said towards the close of his life, "but to myself I seem to have been only like a boy playing on the seashore, and diverting myself in now and then finding a smoother pebble, or a prettier shell, than ordinary, whilst the great ocean of truth lay all undiscovered before me."

Let us now proceed to what lies more immediately to our hand. Those who have had the task of organizing the arrangements for the present Congress, have been actuated chiefly by the desire that useful results should follow from it. With that view they have endeavoured to apportion the very short time at our disposal to the consideration of special subjects, carefully selected, such as seemed likely to be elucidated by the mutual exchange of thought between men of weight and experience coming together from distant places. They think themselves fortunate in having, in so many instances, secured the co-operation of distinguished masters, who have, we have reason to believe, made special studies for their addresses, and whose words will be received, I am sure, with the respect to which they will be so well entitled.

In our own proper section of Ophthalmology, we shall have the advantage, on successive days, of directing our minds to the several important questions set down in our programme. The names of Horner, Snellen, Leber, Adolf Weber, and De Wecker, assure us that the materials for deliberation will be ample, and competently presented to us. There are also additional communications by able men, bearing on the same matters, and these will be read in juxtaposition, previous to opening the debates. The high reputation of so many of our members raises our expectations as to the results.

As it is very desirable that a good record of our discussions should be preserved in our Transactions, it is earnestly hoped that every member who may favour us with his opinions should be as clear and as terse in the expression of them as may be; and should, at latest, by the following morning, while the memory is still fresh, give a copy of his remarks in writing to the Secretaries. As to this, facilities will be afforded, and failing this, the Secretaries cannot be responsible for the publication, as we have no authorized reporters.

To-morrow the first of the distinguished men whom I have just now named, will place before us a subject of great interest and importance, the Antiseptic Method in Eye Surgery. I presume that no one nowadays will question the evils we are so familiar with in our practice, and which have so often marred the intention of well-devised operations skilfully performed, but where, as we hear it said, Nature has failed to do her part, to second the effort of the surgeon by a due process of repair. The study of the causes of such failures and of the means of obviating them, constitutes far the most brilliant page in the history of Modern Surgery; and in other sections of this Congress, while the name of Lister will be applauded, the wide questions he has raised, and in raising has so often cleared up, will receive the full consideration they call for.

In the case of the organ of sight, specially constituted, and in some respects screened from injury as it unquestionably is, there are reasons why the application of precautionary antiseptic measures, though the principle of them must still assert itself, should take a somewhat special form. Owing to the local structural conditions they may apparently be often more simple, though the possible need of the more elaborate of them should never be allowed to fall out of view.

The tears are a secretion as pure from extraneous particles as is the filtered air in the recesses of the lungs. They are poured out under cover, in the right

place, in quantity suitable to the need; while the lids diffuse them over the conjunctival surface ere they escape by their proper channels. Their useful and multiple office is performed in a way so simple and so perfect, that no art, however skilful, could pretend to equal it. We should ponder well the deep marvels of adaptation of means to ends, and take heed that we do not hinder exquisite Nature by meddlesome or needless interference, by the *nimia diligentia Chirurgorum*, but only lend it tender and judicious help by our dressings and our methods. We should always still be able to apply the words of our great poet, "The Art itself is Nature."

Three papers, by Dr. Reymond, of Turin, Professor Leber, of Göttingen, and Dr. Emmert, of Berne, relating to this same subject, of antiseptic surgery, will be read before the discussion is proceeded with.

On Friday we propose to treat in our Section the deeply interesting, and I must add the very sad, subject of Sympathetic Ophthalmitis, under the able guidance of Professor Snellen. This in all its aspects and stages is an affection peculiarly calculated to arrest attention. Though it has been extensively and very accurately studied, it yet remains very obscure. Even its anatomical conditions cannot be said to be fully explored; why it should occur is little understood. The explanation of the very remarkable phenomena manifested lies hidden for the present in unknown anatomical and physiological relations, and it is to experiments on the lower animals that we may look with most probability for a clue to the enigma. Humanity will have reason to rejoice when this too-frequent cause of total blindness shall yield to a clearer insight into its nature, and to the consequent hoped-for discovery of the means of prevention or cure; for at present it brings lifelong misery to many homes. Meanwhile experience suggests some general rules which may do something to ward off this terrible malady, or help us, in some instances, to control it, even now and then to check its progress temporarily, and, perhaps, permanently. The difficulty lies in the application of such rules, and to this point our discussions may, I think, very usefully be directed.

An important paper by Dr. Brailey, on "Pathological Changes in Sympathetic Ophthalmitis," and another by Dr. Poncet, of Cluny, on the "Histological Examination of an Eye Enucleated after Enervation," will be read in this connection.

On Saturday, the main topic for us will be introduced by Professor Leber. It is one of a class which has recently been shown to have much wider relations than could have been imagined possible some few years ago, and which is certainly destined to attract more and more attention, not only from ourselves, but practitioners at large. The immortal invention of Helmholtz, by opening to the view of all instructed men the marvellous background of the transparent chambers of the eye, has gradually awakened inquiries on the part, first, of oculists, and then of physicians, which even in their infancy have yielded results of rare and unexpected value. The changes visible by the Ophthalmoscope will naturally be noted down, and their varieties and sequences determined, before the precise interpretation of them by exact structural examination, and their true pathological import, can be ascertained.

These only admit of being worked out slowly, as opportunities, often rare, give occasion. Our knowledge of the relation of those aspects of the fundus of the eyes to what is concurrently going on in the optic avenues, and in the several associated portions of the wondrously complex double brain and spine, must in a great measure lag behind. And we must be careful not to leave for a single moment the safe ground of exact observation; or suffer ourselves to be beguiled by the

wish to make the new knowledge fit into the old, till all seems a delightfully complete system. Such vain imaginations are not in the true spirit of Science. Nevertheless, some broad and general facts already reward the clinical industry and acumen of several physicians, whose names are a sufficient pledge of the reliable character of their results. But I believe those who know the most, will be the most ready to confess, how rudimentary, at present, is our insight into this very important field of inquiry. Indeed, the study of the brain function (employing that term in its widest sense), and of the aberrations occurring in it that we call disease, remains still in its very infancy. It advances, however, with rapid strides, by the several-parallel roads of Human and Comparative Anatomy, Experimental Physiology and Pathology, and of Clinical observation, including Morbid Anatomy; and it cannot be long ere splendid conquests must be won for us in regions which have been so long shrouded in darkness, and so dense, that in our ignorance we have been hardly aware of their gloom. In connection with this discussion a comprehensive paper by Dr. Bouchut will be laid before you.

Glaucoma, the other great subject to be brought before us, is of even more practical importance than Sympathetic Ophthalmitis, because of its far wider prevalence, and its equally fatal consequences to sight when uncontrolled. We shall consider it in two aspects. On Monday, on the initiative of Dr. Adolf Weber, and after hearing papers by Professor Laqueur, of Strasbourg, by Mr. Priestley Smith, of Birmingham, and by Dr. Angelucci, of Rome, all bearing on the anatomical and pathological basis of the subject, we shall discuss its nature and etiology: while on Tuesday the grand problem of its treatment, and chiefly its operative treatment, will undergo critical examination at the hands of one fully entitled to carry great weight with all of us, Dr. de Wecker, whose experience is very extensive. His address will be followed, before the discussion, by communications from Mr. Bader and Dr. Abadie.

It was Albrecht von Graefe, as you well know, Gentlemen—that bright spirit, whose too early death we have not yet ceased to mourn, for ourselves and for Science—who, at the same moment that he announced to the world the discovery of a remedy for Glaucoma, also drew for us, for the first time, the grand outlines of the clinical history of the disease. His treatise will endure as the model work of a most fertile genius. In it he laid down the chief sub-divisions of the subject, and how far his remedy was likely to be applicable in each. This single paper constituted an epoch in our department of the medical art. It was read, but hardly discussed, at Brussels, at the Second International Congress of Ophthalmology, September, 1857.

Several of those now present were there. The impression produced among them was profound. But yet we are still, twenty-four years later, anxiously inquiring what is the essential nature of the Glaucomatous process, and what is the best remedy to employ.

It is, indeed, quite true that since that time our clinical knowledge of Glaucoma has been greatly extended, and its varieties and complications recorded with some approach to completeness. Extensive researches, anatomical, experimental, and other, have also been undertaken to account for the remarkable train of phenomena we observe. Attempts have also been repeatedly made to explain the *modus operandi* of Von Graefe's celebrated remedy, but as yet, it must be allowed, without entire success. The treatment by Iridectomy, too, has been largely tried, sometimes with modifications, and on the whole it has been admitted to be the best and most reliable. The time, the method, the conditions of applying it to the

varieties of eye-tension have been in many particulars, though not with universal concurrence, defined and accepted.

But, as was perhaps inevitable, men asking themselves always *how* Iridectomy arrested the Glaucomatous process, were now and then led to desire and to propose, and then to inculcate, other methods, having the same end in view, proceeding too often on some fancy or speculation, the validity of which experience has not sustained. Some of these methods, after obtaining a certain currency, have fallen into merited disfavour, while others remain more or less worthy of discussion, some perhaps of general adoption, under limitations to be yet laid down.

It would be quite foreign to my present purpose to pass any opinion on particular modes of operating. We hope on Monday to hear the great problem, the Pathology of Glaucoma, well handled by our distinguished colleague from Darmstadt, and on Tuesday to learn, and debate upon, the latest conclusions on its surgical treatment, announced by our eminent *confrère* from Paris.

Many contributions are furnished on other subjects than those to which I have hitherto adverted, and some of them bear upon a question of great and permanent importance, to which I would now ask your attention for a few moments.

The precision of our modern methods of determining the accuracy of sight, and of the sense of colour, has at length made it possible to urge with increasing earnestness, on authorities responsible for the lives of travellers, whether by land or sea, the necessity of enforcing adequate test-examinations, not only on candidates before engagement, but subsequently, at stated intervals, on all persons employed, where good sight is an essential qualification.

If this be important in regard to railway drivers, guards, and signal-men, it is even far more so in the maritime service. On land, each Government is in a very direct manner held responsible to its own citizens, and accordingly much has been done of late years in several countries, though effectually I fear in very few, to institute strict periodical examinations under State authorization and control. As to these, perhaps, a very close uniformity through different countries is not so very necessary, however desirable. But it is matter of common and urgent concern to all nations, that on the open seas, on coasts, and in harbours, an uniform system should prevail, as to the due and sufficient and periodical testing of the sight of those who may be in the position either to give or to observe signals, on the prompt discrimination of which a multitude of precious lives may at any moment depend.

And I trust it may not be very long ere such an uniform system of tests as Science can now supply, and also the obligation to put them in force among their own subjects, will be willingly accepted by all civilized States.

The present seems a favourable opportunity for coming to some conclusions, and for laying down some definite rules, which by their clear and practical character may be likely to meet with general acceptance, and for pressing these with some urgency on Governments throughout the world.

It is for your consideration, Gentlemen, whether a Committee of this Section, the composition of which might be International, may not with advantage be appointed to deliberate on this grave subject, and to report to us before the Congress closes.

I entertain the confident hope that any recommendations emanating from such a source, bearing, as they would probably do, the impress of moderation and good sense, as well as of exact knowledge of the subject-matter, would everywhere meet with the most favourable attention of statesmen, and be admitted by them as carrying great weight.

I would suggest such a Committee, with Prof. Donders as Chairman, if he would be so good as to undertake that office.

Gentlemen, we anticipate hard work, within the narrow limits of our sittings. I trust we shall be able to assemble punctually, so as not to waste moments which can never be recalled.

One more remark—There will be, I fear, the unavoidable difficulty and source of confusion in our converse, arising through the want in some of us of familiar acquaintance with one or more of the languages in which others are giving expression to their views. It is but too certain that we have not yet a common tongue, however probable it may be that mankind are tending in that direction. Misapprehension of each others' meaning is not unlikely to occur, and, at any rate, both the expression and the recognition of ideas will be impeded.

To lessen as far as possible this drawback, great pains have been taken to prepare, in the three official languages of the Congress, a suitable abstract of every paper, and to place these abstracts in the hands of every member who may wish to acquaint himself beforehand with the Authors' propositions.

Besides the volume of Abstracts, comprising those of all the Sections, a few separate copies of those proper to our own will be in our meeting-room, for the use of those who may not happen to have the volume at hand. These copies remain in the room.

The Executive of the Section have reason to thank the Authors for the promptitude with which in most cases the abstracts have been furnished to our indefatigable and able Secretaries, who have been at the pains of collating them. If any faults of translation or of printing should be discovered, they will doubtless be attributable to the pressure under which the laborious task has had to be accomplished.

And now, my dear Friends and Colleagues, let me say, that if some difficulties of the kind just mentioned await many or most of you, how much must you find them enhanced by the circumstance, unfortunate for himself also, that your President is to a great extent ignorant of the languages, French or German, in which many of the most valuable communications will be addressed to you, and the speeches delivered. All my life long I have regretted the slightness of my acquaintance with those foreign tongues, which in the past, as in the present, have been and are the channels by which priceless discoveries have been announced to the world, as well perhaps as the media of keen, even burning, controversies, when men encounter each other in their search after truth. Thus, and from other causes appreciable enough to most of us as life advances, we are apt to fall relatively into the background, and to have to rest content in finding our pleasure rather in learning at second hand, and after some interval of time, what others have been happily accomplishing, than in hoping to establish for ourselves, or to maintain, a forward place. But never till the present moment have I had so much cause to lament my many deficiencies, since now they must of necessity affect others even more than myself. I rely, however, with full confidence, on your kindness and indulgence, otherwise I could never at all have ventured to undertake the honourable office of being your President at this great Congress.

It was proposed by Mr. Critchett, seconded by Dr. Argyll Robertson, and carried unanimously, that "A Committee be appointed by the Section to deliberate concerning the Tests of Vision and Colour Sense most applicable to persons employed in Working or Observing Signals by Land or Sea, where the lives of others were involved;—and to report thereon to the Section."

It was proposed by the President, and carried unanimously, that the following members of the Section constitute the Committee :—

*Chairman: Professor Donders, LL.D., F.R.S., Utrecht, Consulting Oculist of State Railways; for the Netherlands.

*Wm. Bowman, LL.D., F.R.S., London, President of the Ophthalmological Section of the Congress; for Great Britain.

Dr. Dufour, Lausanne; for Switzerland.

Dr. Gama Lobo; for Brazil.

Dr. Samuel T. Knaggs, Member of the Medical Board of New South Wales Government Railways; for N. S. Wales.

*Professor Leber, Göttingen; for Germany.

Dr. Libbrecht, Ghent, delegate from the Belgian Minister of Public Works; for Belgium.

*Dr. L. Maréchal, Brest, Médecin Principal de la Marine, delegate from the French Government; for France.

Dr. Ole Bull, Christiania; for Norway.

Dr. Osio, Madrid; for Spain.

Dr. Reymond, Turin; for Italy.

J. T. Rudall, F.R.C.S.E., Melbourne; for Victoria.

*Professor W. Thomson, Philadelphia, Examiner to the Pennsylvania Railroad; for United States.

Dr. Warlomont, Brussels, delegate from the Belgian Government; for Belgium.

*Secretary: Dr. Brailey, London, one of the Secretaries of the Ophthalmological Section of the Congress.

Die Antiseptische Chirurgie bei Augenkrankheiten.

Professor Horner, Zurich.

Hochverehrter Herr Präsident, hochgeehrte Herren Collegen,—An diesem Platze, in diesem Lande über Antisepsis zu sprechen, könnte kühn genannt werden, wenn mich nicht die ehrenvolle Einladung des Comités berechtigte und wenn ich nicht gerne laut ausspräche, was auch wir Augenärzte dem Manne verdanken, der den mächtigen Umschwung der modernen Wundbehandlung hauptsächlich bewirkt hat.

Das Thema: "Antiseptic Methods in Eye-Surgery," darf ich wohl einschränken und nur specieller erörtern: "the employment of antiseptic methods in cataract extraction." Einerseits fällt die Anwendung der antiseptischen Methoden bei Operationen an den Lidern, den Thränenorganen, in der Orbita ganz in das Gebiet der chirurgischen Wundbehandlung überhaupt; anderseits ist Alles, was für die wichtigste Bulbusoperation—die Staarextraction—als erprobt erkannt wird, auch für alle andern Operationen am Auge selbst gültig. Dazu kommt, dass sich differente Ansichten wesentlich nur bei der Lehre von der Staarextraction geltend gemacht haben.

Wenn wir die Frage der Anwendung der antiseptischen Methode bei der Staarextraction inductiv behandeln wollen, so thun wir wohl am besten, zuerst die

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* Those marked with an asterisk were named as a working Sub-Committee.

Ursachen der Verluste, besonders der primären Wundeiterungen kritisch zu beleuchten, eventuell die Gründe der glänzendsten Statistiken anzudeuten und auf die Resultate dieser Untersuchung unsere Ansicht aufzubauen. Es scheint mir dass dieser Weg besonders geeignet sei, uns vor blosser theoretischer Deduction und unbedingter Annahme eines Dogma's zu bewahren.

Wenn ich die sämmtlichen primären Verluste, welche ich unter 1,090 Extractionen nach von Gräfe's Methode beobachten konnte, zusammenstelle, so scheiden sie sich ursächlich in folgende Rubriken:

I.—*Directe Infection von aussen.*

(*a*) *von der Umgebung des Auges aus:* Krankheiten *der Lider, des Thränensacks, der Conjunctiva.*

Hiezu müssen auch z. Theil die Fälle plötzlich sich entwickelnder Eiterungen gerechnet werden, welche noch am fünften, ja achten Tage durch gewaltsames Aufdrücken der Wunde entstehen.

(*b*) *von Operationsmaterialien aus:* Schwämmen, Instrumenten, Verbandmaterial.

(*c*) durch *pathogene Bacterien*, welche *vom Patienten und seiner Umgebung* durch eiternde Wunden (Beingeschwüre, &c.) geliefert oder durch das Operations- oder Wartpersonal eingebracht werden. (In grossen Spitälern mit sehr gemischter Bevölkerung und in grosser Nähe von Fäulnissproducten, sowie bei Beschäftigung der Assistenten, &c., mit septischen Substanzen, kann diese Rubrik an Bedeutung gewinnen.)

II.—*Infection durch besonders günstigen Nährboden für Coccen-Entwicklung.* Trotz Mangel einer nach Qualität oder Quantität besonders aggressiven Infection haftet sie wegen der günstigen Localbedingungen. Dies wird begünstigt:

(*a*) durch Alles, was *den Wundbezirk in seiner vitalen Energie herabsetzt:* schlechtes Wasser, rohe Wundsetzung und Quetschung, zu starke und unreine Antiseptica, welche ätzend wirken und locale Gewebenecrose bedingen.

(*b*) durch Allgemeinzustände, welche erfahrungsgemäss den Widerstand der Gewebe gegen locale Infection herabsetzen: Alcoholismus (cfr. Ulcus serpens). Diabetes, &c. (Hohes Alter allein kommt nicht in Betracht; jeder Operateur weiss, dass gerade frühzeitige Cataractbildung schlechtere Prognose giebt.)

Die secundären Verluste durch Iritiden und Iridocycliten schleichenden Verlaufs fallen ebenfalls in die 2. Gruppe, sei es, dass der Operationsverlauf zu ungünstigen Wundverhältnissen führte, sei es, dass der Allgemeinzustand sehr bedenklicher Natur war, sei es endlich, dass besonders günstiger Nährboden zur Fertilisirung von Coccen gegeben wurde—trotzdem diese weder in grosser Zahl noch von pathogener Herkunft vermuthet werden konnten. Als ein solcher besonders günstiger Nährboden ist zu betrachten: reichliche Corticalsubstanz im Pupillargebiet und Glaskörper in der Wunde.

Es ist wohl am Platze, die so eben gegebene Eintheilung der Ursachen primärer und secundärer Verluste noch etwas näher zu beleuchten durch Hervorheben der wesentlichen Aenderungen, welche dadurch ganz verbreitete Ansichten erfahren, wie schon von de Wecker hervorgehoben wurde.

Wie Sie wissen, dreht sich der Hauptkampf in der Lehre von der Staarextraction um *Schnittgrösse, Schnittform* und *Schnittlage.* Die Lösung gestaltet

sich äusserst einfach, wenn man die Erfahrungen der Klinik zu Hülfe zieht. Die *Schnittgrösse* hat, sobald man überhaupt innerhalb der Gränzen physicalischer Nothwendigkeit verbleibt, keine grosse Bedeutung; wir sehen einerseits die glänzende Statistik Jacobson's und anderseits die allseitige Bestätigung, dass Iridectomie-Schnitte fast nie zur Eiterung führen. (Ich habe seit 1862 auf viele Tausende von Iridectomieen keine Wundsuppuration gesehen.) Die untere Grenze der Schnittgrösse ist gegeben durch die Gefahr der Quetschung resp. der Verminderung der vitalen Energie der Wundränder; die obere durch die Maximalgrösse der Linse selbst.

Die *Schnittform* darf weder die locale Disposition zu Gewebsinfection durch Erschwerung der Passage (Quetschung, Einführung von Instrumenten, &c.) steigern, noch auch dadurch die unbedeutendste Infection gefährlich machen, dass die demarkirende Arbeit der Gewebezellen durch allzu grosse Entfernung vom Ernährungsgebiet erschwert wird.

Die *Schnittlage* endlich ist, abgesehen von den zwingenden physicalischen Bedingungen, durch unsere ganze klinische Erfahrung über die Unterschiede zwischen dem Verlaufe centraler und peripherer Hornhautentzündungen nothwendig eine periphere.

Treten so die Anschauungen über die Wichtigkeit kleinster Unterschiede in Schnittgrösse, Schnittform und Peripheriсität für den Erfolg wesentlich in den Hintergrund, vorausgesetzt, dass man sich vor Extremen hütet, welche physicalischen Gesetzen und klinischen Erfahrungen gleich sehr widerstreiten, so gewinnt unsere Rubricirung der Verlustursachen noch mehr Bedeutung, wenn man sich gegenwärtig hält: dass die grosse Mehrzahl der rapidesten Eiterungen gerade bei hergestellter vorderer Kammer erfolgt, während der länger dauernde Abfluss des Humor aqueus günstig wirkt. Die Irrigation der Wundränder durch das stetig abfliessende Kammerwasser verhütet die Festsetzung einer Wundinfection. Diese Erfahrung zusammen mit der Richtung der perlmutterfarbenen Streifen (streifige Keratitis), sowohl bei Randwunden, als bei infectiösem traumatischem Geschwür (Ulcus serpens) lehrt deutlich die Abhängigkeit der Wundentzündung von äusserer Infection.

Der Schilderung der primären Verluste müsste nun die Kritik der Umstände folgen, welche besonders glänzende Erfolge bewirkt haben. Es wäre leicht zu zeigen, wie bald die sorgfältigste Antisepsis, bald die günstigsten Aussenverhältnisse, dann die ausgesuchteste Delicatesse in der Ausführung der Operation oder die Vermeidung jeder Gefährdung der Wundränder die Nachtheile des Operationsmaterials oder der Umgebung beherrscht haben. Doch vermeide ich lieber diesen in's persönliche Gebiet eindringenden Excurs und resumire die Thatsachen kurz dahin:

Die unglücklichen Ausgänge der Staarextraction sind unter Voraussetzung vernünftiger Schnittform, Schnittlage und Schnittgrösse am sichersten zu beschränken.

1.—*Vor der Operation*, durch die präventive Antisepsis des Operationsterrains im weitesten Sinne des Worts, sowie aller mit dem Patienten in nähere Berührung kommenden Individuen und Objecte.

2.—*Während der Operation*, durch Bewahrung des Wundbezirks vor Schwächung seiner vitalen Energie und Schutz der Gewebe gegen infectiöse Einflüsse.

3.—*Nach der Operation*, durch Desinfection des Operationsgebietes und genügenden Schutz vor secundären Infectionen.

Diese Ueberlegungen müssen der Technik der Antisepsis zu Grunde gelegt

werden, stets gleichzeitig berücksichtigend die Verhütung der Infection und die Kräftigung des Widerstands der Gewebe.

1.—*Die präventive Antisepsis* hat sich zuerst auf den Patienten selbst zu beziehen, der womöglich gebadet und in reiner Kleidung zur Operation kommen soll.

Eiternde Wunden werden aseptisch, Ozæna ebenfalls durch Nasendouche mit desinficirender Flüssigkeit wenigstens temporär unschädlich gemacht, u. s. w.

Der *Allgemeinzustand* bedarf bei ausgeprägtem Alcoholismus einer Vorbereitung durch allmählige Entwöhnung, bei Diabetes durch physiologisch richtige Nahrung.

Eminent wichtig ist der Zustand der Lidränder, der Bindehaut und vor Allem des *Thränensacks.* Bei Catarrhen und Blennorhöen des letztern operire ich unbedenklich, sowie nach Spaltung des obern Thränenkanälchens der Nasengang mit Hülfe der hohlen Sonde energisch ausgespritzt und desinficirt werden konnte. Eine Inundation des Operationsgebiets mit einem Antisepticum vor und nach der Extraction und ein antiseptischer Verband sind unumgänglich nöthig.

Von Operateur, Assistenten und Wartpersonal könnte man dieselbe Gewissenhaftigkeit fordern, wie sie jeder Chirurg bei der Ovariotomie als selbstverständlich verlangt. In dieser Hinsicht wird nicht selten gefehlt. Nicht allein schreitet man sofort zur Operation nachdem man sich stundenlang in der sehr zweifelhaften Atmosphäre des angefüllten Ambulatoriums befand, ohne eine genügende Desinfection vorausgehen zu lassen, sondern auch, nachdem man sich im Bereiche von Productionsflächen pathogener Bacterieen aufhielt (Anatomie, Sectionen, &c.).

Die zur Operation nöthigen *Utensilien* bedürfen besonderer Rücksicht. Ich habe eine Reihe Stoffe in wirksamen Concentrationen (4 per Cent) darauf geprüft, ob sie die Messer und damit die Reinheit der Wunde bei längerer Einwirkung schädigen. Bor- und Salicylsäure sind nicht zu gebrauchen, da sie die Schneide sofort schädigen; besser ist reine Carbolsäure, ganz unschädlich benzoesaures Natron; Resorcin (und wohl auch Hydrochinon) geben bei langem Liegen einen schmierigen Belag, verletzen aber die Schneide nicht.

Absoluter Alcohol ist theuer, und darf nicht an die Wunde gebracht werden.

Verwerflich sind Schwämme, wenn sie nicht aus 5 per Cent Carbolsäurelösung entnommen, mit reinstem, abgekühltem Wasser oder in dünner Carbollösung (1 per Cent) angewandt werden. Sie sind leicht zu ersetzen durch eine gutbereitete 5 per Cent Salicylwatte.

Zum Operationsterrain im weitesten Sinne müssen wir auch das *Zimmer* zählen, in welchem operirt wird.

Gewiss ist es ein wesentlicher Unterschied, ob man in Räumen operirt, welche äusserster Reinhaltung zugänglich sind, oder in Zimmern, welche klein, nach keiner Richtung frei, inmitten grosser Krankheitsheerde fast nothwendig mit pathogenen Bacterien gefüllt sein müssen. Ich selbst mache meine Operationsräume nur durch die ergiebigste Lüftung und Reinigung aseptisch, und kann mit nicht völlig 1,6 per Cent Totalverlust während zehn Jahren zufrieden sein. Allein in grossen Spitälern, inmitten enger schmutziger Strassen, fern von einem ausgedehnten Luftraum würde ich eine regelmässige Desinfection der Zimmer durch andauernden Dampfspray, &c., namentlich vor Operationszeiten für nöthig halten. In diesem Sinne, dass die ganze Luftmenge des Operationsraums sorgfältig desinficirt werde, möchte ich von einem Luftspray sprechen.

2.—Nun wäre Alles zur Operation bereit: Zimmer, Instrumente, Operateur und Assistent, der Patient ebenfalls, und es fragt sich bloss, ob die Operation selbst unter *Spray* zu geschehen hat oder eine Inundation des Operationsgebiets genügt.

Ich habe den Spray nach einigen Versuchen ganz aufgegeben, da mir die minutiöse Genauigkeit der Operation darunter zu leiden schien, und das Bedürfniss in meiner Statistik nicht vorlag. Die glänzenden Resultate einiger Operateure, die stets unter Spray operiren, sind bekannt und beweisen die Ausführbarkeit. Ich meine natürlich nicht jene illusorischen Sprühregen sehr verdünnter (1 per Cent und darunter) Carbolsäurelösungen, welche auf dem Operationsfelde in einer Verdünnung ankommen, die keine Sicherheit gewähren kann.

Unter den Chirurgen macht sich gegenwärtig eine allgemeine Reaction gegen den Spray geltend, und die glänzendsten Statistiken aseptischer Operationen ohne Spray erregen unsere Bewunderung. Bedenken wir, dass durch zu concentrirte oder an sich ätzende Antiseptica der Spray zu oberflächlicher Wundnecrose und damit zu Eiterungen führen kann; dass durch den Spray die Luftkeime geradezu auf die Wunde niedergerissen werden, und seine Wirkung einzig darin bestehen kann, "durch Aufschlagen einer geringen Menge des Antisepticums den Nährboden (die Wunde) für die Keimung ungünstig zu gestalten." Diesen Zweck können wir auf viel einfachere, und weniger störende Weise erreichen, indem eine Flocke 5 per Cent Salicylwatte in kalt gesättigter Salicyllösung benetzt und sachte über Lider und geöffnetes Auge ausgedrückt wird. Die Uebergangsfalten werden so besser gereinigt als mit dem Spray, und die Procedur ist viel weniger reizend als die Anwendung eines Carbolspray von genügender Concentration bei nicht narcotisirtem Patienten.

Man mag über die Sprayfrage noch verschiedener Ansicht sein; man kann die Anwendung des Spray eclectisch empfehlen in Fällen wo voraussichtlich durch Glaskörperverfall oder Belassen von Corticalsubstanz ein besonders günstiger Nährboden für Keimung von Bacterien bereitet wird; gewöhnlich ist er unnöthig und durch eine leichte Inundation des Operationsgebiets zu ersetzen.

Die delicateste Ausführung der Operation selbst ist eines der wichtigsten Schutzmittel des Auges. Je besser die Instrumente sind, je zarter sie geführt werden, je mehr jede Erschütterung des Bulbus vermieden wird, desto resistenter bleibt das Gewebe des Wundbezirks, desto weniger günstig ist es für septische Vorgänge. Ich stehe nicht an zu erklären, dass nach meiner Beobachtung bei gleich geübten Operateuren und annähernd gleichem Material der Unterschied in der Zartheit der Ausführung der Operation das Resultat der Statistik wesentlich beeinflussen wird.

3.—*Die Operation ist beendigt*, der Wundrand coaptirt, der Conjunctivallappen, diese wichtige Deckung der erst später sich schliessenden Hornhautwunde, ausgebreitet, eine nochmalige Inundation des Conjunctivalsacks in der angegebenen Weise ist leicht und rasch auszuführen.

Nun folgt der *Verband*. Haben wir jede Infection aus dem Conjunctivalsack und dem Thränensack unmöglich gemacht und die Operation möglichst aseptisch ausgeführt, so müsste ein Verband mit reinster Watte genügen, sowohl die Lider in Ruhe zu halten, als eine Luftinfection zu vermeiden. Vergessen wir nicht, dass wir in der Mehrzahl der Fälle nach sechs Stunden die Wunde coaptirt finden, und ausserdem durch ihre Lage nach oben fast die Bedingungen einer subcutanen Wunde haben. Wirklich habe ich mich früher wegen dieser speciellen Verhältnisse gewöhnlich dieses Verbandes und nur ausnahmsweise des von circa vier Jahren beschriebenen nassen Salicylverbandes bedient. Anstatt letztern nur eclectisch bei Blepharitis, Conj. Catarrhen, Thränensackleiden zu gebrauchen, verwende ich ihn aber nun immer allgemeiner nach der Staarextraction, wie schon lange bei

allen Plastiken, Enucleationen, &c. Ist er doch auch in mehreren chirurgischen Kliniken, besonders bei Gesichtsoperationen, als vorzüglich erprobt.

Die Kritiken, welche dieser Salicylverband erfahren hat, beweisen, dass ich ihn ungenügend beschrieb. Er besteht aus 5 per Cent Salicylwatte, welche in einzelnen Flocken, durch Salicylwasser benetzt, aufgelegt wird, und zwar in genügender Menge um einen Abschluss nach aussen zu sichern. Eine leichte Calicot-Binde hält die Watte, welche circa alle 4—5 Stunden von Neuem mit Salicylwasser benetzt wird. So erhält man einen sichern, gut anschliessenden, kühlen Verband der von der Haut der Lider ertragen wird. Seine Entfernung und Wiederholung ist nicht zu mühsam. Dies ist nöthig! Keine Temperaturerhöhung verräth uns die ersten Anfänge eines abnormen Verlaufs; nur das geübte *Auge* sieht die Zeichen einer beginnenden Wundeiterung. In jedem Falle, wo Operationsverlauf, Allgemeinzustand, grössere Empfindlichkeit Verdacht erregen, soll nachgesehen werden; denn es gelingt selbst eine ausgebrochene Wundeiterung völlig zum Stillstand zu bringen und zu beherrschen. Um dies zu erreichen, muss man die Regeln der Chirurgie über das "Aseptisch-Machen eiternder Wunden, Höhlen, &c." im vollen Umfange befolgen.

Der Conjunctivalsack wird mit 2 per Cent Carbolsäurelösung ausgespült, die Hornhautwunde mit einem in antiseptische Flüssigkeit getauchten Spatel eröffnet. Mit diesem, immer von Neuem befeuchtet, wird die Vord. Kammer und das Pupillargebiet allseitig aseptisch gemacht, und infiltrirte Corticalis entfernt. Diese Procedur soll, wie bei Spaltung eines septischen Hornhautgeschwürs, von 6—12 Stunden wiederholt und jedesmal der nasse Salicylverband aufgelegt werden. Die Beherrschung wird unterstützt durch Chinin und Wein innerlich, sowie durch Befolgen des vortrefflichen Raths von Snellen solche Patienten an möglichst frischer Luft spazieren zu führen.

Bei Patienten, welche schon nach achtzehn Stunden massenhafte eiterige Conjunctivalsecretion, Chemosis, purulente Iritis mit Ausfüllung des Pupillargebiets zeigten, wurde so die Eiterung sistirt, der Bulbus erhalten und sogar ein Sehvermögen von einem Drittel erreicht.

Entschieden einfacher wäre es, anstatt die Wunde aufzusprengen, sich eines Drain-Röhrchens zu bedienen, das sehr wahrscheinlich auch präventiv angewendet werden könnte; allein ich habe die technischen Schwierigkeiten noch nicht überwunden.

Die Grundsätze erlauben eine Anpassung an die Verhältnisse jeden Operationsterrains, und sind geeignet die Leistung der Staaroperation noch zu erhöhen.

Acceptiren wir die Zahlen der Statistik von H. Noyes mit der arithmetischen Berichtigung von A. Geissler, so haben wir:

Bei der Lappenextraction	Verluste	10·4 per Cent
„ „ Linearextraction	„	5·8 per Cent

Ich habe schon bemerkt, dass ich die Wiederbelebung der alten Lappenextraction nicht für berechtigt halte. Die Lebensbedingungen des Wundrandes bei einer Proportion von Wundbasis zu Lappenhöhe wie 2 : 1 (anstatt mindestens 4 : 1) sind zu ungünstig, und die Gefahren secundärer Infection durch Aufsprengen der Wunde zu gross. Es beschäftigt uns nur die Linearextraction in der Modification, welche allgemein zu Gunsten einer weniger peripheren Lage der Wunde und damit einer grössern Lappenhöhe eingeführt wurde.

Die Resultate dieser Linearextraction werden nun—das zu behaupten erlauben die vorhandenen Zahlen—erhöht durch eine dem Auge angepasste Antisepsis.

Es werden nicht nur die geübtesten Operateure, nicht nur diejenigen, welche, wie ich, in den besten Aussenverhältnissen operiren, sehr gute Resultate erringen, sondern die Antisepsis gewährt auch dem weniger Geübten bessere Erfolge, weil die Schädigung der vitalen Energie des Wundgebiets nicht so gefahrvoll wird, eine Schädigung, die eben nur die Delicatesse des geübten Operateurs regelmässig zu vermeiden weiss.

Hochgeehrter Herr Präsident! Hochgeehrte Herren Collegen!

In der mir zugemessenen Zeit konnte ich die Frage der Antisepsis bei der Staarextraction nicht *erschöpfend* behandeln. Es schien mir ausreichend, die Grundsätze, welche uns leiten müssen, zu discutiren, und an der Hand meiner Erfahrungen meine Ansicht klar zu legen.

Hoffen wir, dass bald grössere Zahlen den Beweis liefern werden: dass wir wieder einen Schritt *vorwärts* gethan haben, zugleich zur Ehre der Wissenschaft und zum Heile unserer Mitmenschen.

The Antiseptic Method in Cataract Extraction.

Prof. C. Reymond, Turin.

The present paper is in continuation of what I said at the last International, Ophthalmological Congress on Lister's Antiseptic Method in Cataract Extraction. My object then was to show:—(1) that a solution of 1·75 °/₀ of absolute phenol was well borne by the eye; (2) that Lister's method strictly carried out (with one exception only that hydrophile gauze was used, which had previously been soaked for some days in the same solution, and was kept moist during the whole treatment) had reduced to a trifling number the primary corneal sloughings till then so common in my hospital practice.

The present paper contains statistics of all my cataract extractions from January 1, 1880, to July 1, 1881, a total of 346. During part of the present year I have used, instead of the moist dressings above referred to, Lister's carbolized gauze prepared according to his instructions. These statistics seem to support the conclusion that Lister's method, if strictly observed, almost entirely prevents corneal sloughing, and, that inflammation of the lacrymal sac is no longer a source of danger, since the discharge ceases during the dressing.

As a general rule the dressing is not opened till the sixth day, when it is replaced by boric lint. I think it necessary to continue the dressing with boric lint for some days so as to prevent partial infiltrations of the wound, which may occur even after the cessation of the carbolic dressings; but these yield to the use of chlorine water and boric acid dressings. Several hours before operating, the beard and lower part of the forehead are shaved, the conjunctival sac washed out with the carbolic water, and the eye tied up with gauze and cotton-wool soaked in the same solution, to be removed only at the moment of operating. The spray causes no inconvenience, and is probably indispensable; it is certainly very useful, for, by making the eye anæsthetic, it materially aids us in dispensing with chloroform. The antiseptic method does not quicken the healing of the wound, if we judge by the frequency, under its use, of slow healing with perfect transparency. The method has of course no influence on the direct consequences of an imperfect operation. The commonest imperfections in the healing of the wound are:—(1) Greyish infiltration of the edge of the flap, the scar remaining afterwards whitish; the scleral part of the wound is rarely affected. (2) Lines of infiltration parallel with each other and perpendicular to the edge of the wound. (3) After the cessation of the carbolic

dressing, a form of keratitis, beginning as whitish points in some part of the corneal flap, sometimes rather severe, and slowly proceeding to sclerosis of the affected parts of the cornea; this form occurs chiefly in old or weakly patients. The above results are not peculiar to the antiseptic method, being well known with other kinds of dressings. (4) In the wound, a greyish, felt-like substance forms, and increasing downwards towards the pupil, sometimes obliterates it. The microscope shows that it is not caused by pieces of the capsule (like those described by Dr. Knapp). It is only seen where the antiseptic dressing is applied, or borne, badly. The morbid changes just described are nearly always associated with slight fever and frequent changes of general body temperature.

In 346 extractions, made with antiseptic precautions, between January 1, 1880, and July, 1, 1881, under ordinary conditions (including 3 cases complicated by detachment of the retina, and 6 with inflammation of the lacrymal sac), the operative results were as follows:—

Ordinary cataracts		346
Immediate success	326	
Successful, after secondary operation for closed pupil	9	
Pupil closed, but case suitable for secondary operation	4	
Loss by sclerosing keratitis (No. 3 of the above-described varieties)	1	
Loss by suppuration of cornea (5 too unruly to keep the dressing well applied; 1 had paralysis of facial nerve on operated side and anæsthesia of opposite side of face)	6	
Traumatic cataracts		9
Successful	5	
Closed pupil, result uncertain (traumatic cataract in glaucomatous eye)	1	
Failure (shrinking without suppuration, 2; suppuration under carbolic dressing, with foreign body in eye, 1).	3	
Extractions in specially bad conditions (irido-choroiditis) &c.		4
Successful	3	
Failure (case of sympathetic iritis)	1	
Extraction of false membranes (antiseptically), all successful		5

Errors in healing retard recovery, without definitely compromising it. They are always accompanied by a peculiar form of catarrh of the conjunctiva, in which the discharge is viscous, greyish, or rather bluish, stringy, or flaky, and showing many little white dots. There is uniform conjunctival injection, with slight infiltration and thickening. The discharge is sometimes more solid, gelatinous, and adherent to some ulcerated point of the wound, or it may penetrate into the anterior chamber in the fibrillar form already described (No. 4). It may finally even form a greyish membrane adherent to the wound, and extending more or less over the conjunctiva. This membrane has an amyloid reaction.

Ueber die Wirkung von Fremdkörpern im Inneren des Auges.

Prof. Th. Leber, Göttingen.

Seitdem die überraschenden Erfolge der antiseptischen Wundbehandlung den Beweis geliefert haben, dass die traumatischen Entzündungen im Allgemeinne

durch eine septische Infection hervorgebracht werden, ist es nothwendig geworden, die Wirkung von fremden Körpern, welche in das Innere des Auges eingedrungen und darin zurückgeblieben sind, mit Rücksicht auf die Frage einer genaueren Untersuchung zu unterziehen, wie viel von den Folgezuständen, welche man nach solchen Verletzungen auftreten sieht, der Wirkung des fremden Körpers selbst und wie viel der häufig damit verbundenen Verunreinigung mit septischen Stoffen zuzuschreiben ist. Ich habe es mir zur Aufgabe gesetzt, diese Frage durch Versuche an Thieren zu entscheiden, und bin durch zahlreiche, im Lauf der letzten Jahre angestellte Versuche zu den folgenden Ergebnissen gelangt, welche auch mit fremden und eigenen Beobachtungen am menschlichen Auge sehr gut übereinstimmen.

Die blosse Gegenwart eines reinen d. h. nicht mit entwickelungsfähigen Keimen von Mikrobien behafteten und chemisch indifferenten Fremdkörpers im Inneren des Auges ruft keinerlei Entzündung hervor. Man konnte dieses Ergebniss von vornherein mit Bestimmtheit erwarten nach den Erfahrungen, welche die Chirurgie mit Suturen aus Gold-und Silberdraht gemacht hat und nach der darauf gegründeten Methode Wecker's, der sogenannten Drainage des Auges, bei welcher feine Golddrähte Wochen lang im Auge vertragen werden. Doch ist es immerhin von Interesse, dass ich durch Versuche, welche sich über Jahre hinziehen, die absolute Unschädlichkeit des Verweilens grosser Stücke von Golddraht oder anderer indifferenter Substanzen in der vorderen Augenkammer oder im Glaskörper von Thieren feststellen konnte.

Es ist ein überraschendes Bild, ein Stückchen Golddraht vollkommen frei in der vorderen Kammer zu sehen, das auf den Boden derselben hinuntergefallen ist, oder mit dem Augenspiegel einen im Glaskörper suspendirten Golddraht prachtvoll metallisch glänzend, ohne jede entzündliche Veränderung zu beobachten. Auch Glassplitter verhalten sich ganz ähnlich; so habe ich ein Kaninchen noch jetzt am Leben, welches seit 1¾ Jahren einen langen, schmalen Glassplitter im vollkommen klaren Glaskörper erkennen lässt. Nur an den Stellen, wo der frei bewegliche Splitter kleine Stichverletzungen der Retina gemacht hatte, waren zarte umschriebene Trübungen im Augengrund entstanden. In der vorderen Augenkammer verweilte ein Glassplitter über 6 Monate lang ohne jede Trübung und wurde dann allmälig von einer sehr zarten Bindegewebsschicht eingekapselt. Dass auch beim Menschen Glassplitter im Auge ebenso gut vertragen werden, lehrt eine Beobachtung von Critchett, wo ein solcher Fremdkörper 16 Jahre lang ohne nennenswerthe Folgen in der vorderen Augenkammer verweilt hatte.

Wenn es nun auch von grossem theoretischem Interesse ist, zu erfahren, dass ein so zartes und empfindliches Organ wie das Auge in Bezug auf sein Verhalten gegen chemisch indifferente Fremdkörper keine Ausnahme von den übrigen Organen und Geweben des Körpers macht, so ist doch die praktische Bedeutung dieser Erfahrung sehr gering, weil die grösste Mehrzahl der in das Auge eindringenden fremden Körper nicht als vollkommen indifferent in chemischer Hinsicht zu betrachten sind. Uebrigens sind doch einzelne hierher gehörige Fälle beobachtet; abgesehen von den schon erwähnten Glassplittern hat man beim Menschen kleine Steinfragmente, Cilien, Dornen, &c., unbestimmt lange ohne jeden Reizzustand oder wenigstens ohne eigentliche Entzündung im Auge zurückbleiben sehen.

Bei weitem häufiger sehen wir aber beim Menschen Verletzungen durch Splitter von Eisen, Stahl, Kupfer, Messing, kurz durch Metalle, welche oxydationsfähig sind. Die heftige, eitrige Entzündung, welche gewöhnlich auf diese Verletzungen

folgt, hat man bisher stillschweigend der Wirkung des Fremdkörpers zugeschrieben, ohne zu untersuchen, ob sie nicht vielmehr durch eine gleichzeitige septische Infection entstehe. Diese Möglichkeit muss um so mehr berücksichtigt werden, weil Fälle beobachtet sind, wo nach solchen Verletzungen jede acute Entzündung, namentlich jede Eiterbildung ausgeblieben ist, wenn auch der Fremdkörper durch andere Folgezustände sich nicht als indifferent für das Auge erwies.

Es ist nicht schwierig, bei Thieren ein frisch geglühtes Stück einer Nähnadel oder einen spitzen Kupferdraht in die vordere Kammer oder in den Glaskörper einzuführen, so dass die kleine Stichwunde sich dahinter vollkommen schliesst und der fremde Körper nicht mehr damit in Berührung ist. Auch diese Verletzung ruft nun durchaus keine acute Entzündung und keine Eiterbildung hervor, kann aber andere schwere Folgen für das Auge, namentlich für die Retina, nach sich ziehen.

Bei den Veränderungen, welche das Auge dabei erfährt, hat man die rein chemischen Wirkungen des fremden Körpers, welche am todten Auge ebenfalls zu beobachten sind, von den Erscheinungen zu trennen, welche den vitalen Eigenschaften dieses Organes ihre Entstehung verdanken. Die chemischen Wirkungen beobachtet man am deutlichsten am Glaskörper, in welchen ein Stück Stahldraht eingeführt ist. In der Umgebung des Fremdkörpers bildet sich eine rostbraune Verdichtung des Glaskörpers, deren Farbe von feinen Körnchen von Eisenoxydhydrat herrührt. Die Körnchen finden sich in zunehmender Feinheit noch ziemlich weit von dem Metallstück entfernt. Die in den Augenflüssigkeiten absorbirte Kohlensäure löst ein wenig von dem Metall als doppelt-kohlensaures Salz auf, dieses verbreitet sich durch Diffusion im Glaskörper, wird aber bald in unlösliches Eisenoxydhydrat umgewandelt und in Gestalt von feinen Körnchen ausgeschieden, wobei es sich auch wohl mit den vorhandenen Eiweisskörpern verbindet. In derselben Weise entsteht auch die eigenthümliche rostgelbe Farbe gewisser traumatischer Cataracten, welche man schon lange als Zeichen der Anwesenheit eines Metallstückchens im Auge kennt.

In der vorderen Augenkammer von Thieren bewirkt die Anwesenheit solcher Fremdkörper keine erheblichen Störungen. Ich habe Stücke von Nähnadeln bei Kaninchen Monate oder Jahre lang in der vorderen Kammer ohne Schaden verweilen sehen. Sie incrustirten sich mit einer Oxydschicht und ragten zuweilen nach längerer Zeit wieder an der Einstichsstelle hervor, so dass ich einmal den Fremdkörper mit der Pincette fassen und extrahiren konnte, nachdem er fast 1½ Jahre im Auge gewesen war.

In Bezug auf die Krystallinse ist auch vom Menschen bekannt, dass darin verweilende Metallsplitter, abgesehen von der Cataract, lange Zeit ohne Schaden für das Auge vertragen werden.

Dagegen stellen sich im Glaskörper und in der Retina um so schwerere Veränderungen ein, welche man in den Versuchen mit dem Augenspiegel in ihrer ganzen Entwickelung verfolgen kann, weil dabei keine äussere Entzündungerscheinungen auftreten und die Durchsichtigkeit der Medien grösstentheils erhalten bleibt. Nachdem der im Glaskörper frei suspendirte, oder nach unten gesenkte Fremdkörper sich mit der schon erwähnten oxydhaltigen Verdichtung der Glaskörpersubstanz umgeben hat, welche bei ophthalmoscopischer Untersuchung ein hellglänzendes Aussehen darbietet, sieht man schon nach wenigen Tagen die Netzhaut weit abgelöst, und zwar zunächst in ihrem markhaltigen Theil (es handelt sich um Versuche an Kaninchen), dann auch in ihrem gefässlosen, nicht markhaltigen Abschnitt; zugleich erscheint sie stellenweise eingerissen und zerfetzt, was aber

durchaus nicht von der Verletzung herrührt, sondern die Folge theils ein gradigen Erweichung und Atrophie, theils einer Zerrung durch Schrumpf Glaskörpers zu sein scheint.

Die mikroscopische Untersuchung zeigt eine acute Atrophie der Netz deren Gewebe zahlreiche grosse oxydhaltige Körnchenzellen eingelager letztere finden sich auch im Glaskörper in reichlicher Menge, ebenso in de wenn diese bei Einführung des Fremdkörpers an ihrer hinteren Fläche wurde. Dabei bietet die Netzhaut im ersten Stadium noch folgende höch würdige Veränderungen dar: Die Stäbchen sind zum Theil bedeutend ver sie wachsen in die Zellen des Pigmentepithels hinein, so dass sie bis zu lamelle der Aderhaut reichen. Die Zellen des Pigmentepithels sind st grössert und zeigen von der Fläche her zahlreiche Netzhautstäbchen, kr quer durch einander gelagert, in ihr Inneres eingeschlossen. Die äussere schicht ist stellenweise hügelig verdickt, die Zahl der Körner daselbst v und die Körner selbst in Gestalt und Aussehen verändert.

Ich bin der Ansicht, dass die genannten Veränderungen auf die ch Wirkung zurückzuführen sind, welche die geringen Mengen in den Auge keiten gelöster Metallsalze auf die Netzhaut ausüben, und welche in den elementen derselben gewisse vitale Vorgänge anregen. Einige Beobac sprechen dafür, dass beim Menschen ähnliche Folgen auftreten, wenn der Körper, was gewöhnlich nicht geschieht, zufällig rein, aseptisch ins Aug drungen ist. So habe ich ein Auge enucleirt, wo sieben Jahre zuvor ein Eis chen durch Hornhaut und Linse in die Ciliargegend eingedrungen war. Die liche Reizung war bald vorübergegangen und zwei Jahre nachher fand si matische Cataract bei vollkommen gutem Lichtschein. Erst im weiteren trat zuweilen Röthung des Auges, später auch vorübergehende Schmerzen nach einigen Jahren war der Lichtschein völlig erloschen. Es kam zu Bl in die vordere Kammer, diffuser Trübung und eigenthümlicher brauner Färl Hornhaut, das Auge wurde sieben Jahre nach der Verletzung entfernt. D war vollständig resorbirt, der Eisensplitter sass in der Zonula ciliaris; di haut war vollständig abgelöst und atrophirt, der Glaskörper verschwun die beiden Blätter der abgelösten Netzhaut dicht an einander gelegt; kei von plastischer Exsudation. Die braune Farbe der Hornhaut war durc Vascularisation und hæmatogene Pigmentirung verursacht.

Werden bei den Versuchen an Thieren die nöthigen antiseptischen Vo massregeln versäumt, so tritt auch hier, wie bei zufälligen Verletzung Menschen die Regel ist, leicht eitrige Entzündung im Innern des Au Wenn ich in solchen Fällen den Glaskörper frisch untersuchte, so fand ich zahllosen, feinsten, beweglichen Mikrobien durchsetzt; auch beim Mensch ich mich von dem Vorkommen niederer Organismen bei traumatischer Gla eiterung überzeugt.

Ueber die Wirkung dieser niederen Organismen und von entzündungser Schädlichkeiten überhaupt habe ich noch verschiedene Versuchsreihen an von deren Ergebnissen ich hier der Kürze wegen nur das Folgende mi kann.

Da die blosse Gegenwart indifferenter Fremdkörper im Auge nicht dungserregend wirkt, so können wir uns die Wirkung der Mikrobien nur chemische denken. Wir müssen annehmen, dass diese Organismen durc Lebensprocess gewisse Substanzen erzeugen, welche als Entzündungsreiz davon betroffenen Theile wirken. Die Wirkung dieser Substanzen mu

ähnliche sein, wie die von gewissen chemischen Stoffen, von welchen bekannt ist, dass sie heftig entzündungserregend wirken, wie, z. B. Crotonöl, Canthariden, Arsenik, Quecksilberoxyd &c. Die Wirkung dieser zuletzt genannten Stoffe ist ganz unabhängig von der Betheiligung niederer Organismen, und ich habe mich durch besondere Versuche überzeugt, dass die Folgen dieselben sind, wenn diese Stoffe vollkommen rein, aseptisch in's Innere des Auges eingeführt werden.

Die eben aufgestellte Vermuthung über die Wirkung der Mikrobien wird nun dadurch bestätigt, dass es mir gelungen ist, eitrige Entzündungen in Auge zu erzeugen durch Injection von Extracten fauliger Flüssigkeiten, deren Mikroorganismen durch Kochen oder auf anderem Wege zerstört waren. Wie zu erwarten, geht diese Entzündung nach einiger Zeit wieder zurück, da die lebendigen allmählig durch Resorption aus dem Auge verschwinden, und da die lebendigen Keime fehlen, durch welche sonst diese Stoffe fortwährend auf's Neue gebildet werden.

Die angeführten Versuchsergebnisse werfen auch ein neues Licht auf die schädliche Wirkung gewisser im Inneren des thierischen Körpers, speciell des Auges, lebender Parasiten, insbesondere des Cysticercus cellulosae. Es ist bekannt, und ich kann dies bestätigen, dass diese Entozoen eitrige Entzündung in ihrer Umgebung hervorrufen können. Da die blosse mechanische Wirkung keine Entzündung hervorruft und da hier an eine Betheiligung von Mikrobien nicht zu denken ist, so muss wohl die Annahme gemacht werden, dass diese Parasiten eine entzündungserregende Substanz absondern, wofür ja auch die Analogie mit dem Verhalten mancher anderer parasitär lebender Organismen angeführt werden kann.

Ueber die Häufigkeit gewisser Krankheiten des Auges zu verschiedenen Zeiten des Jahres.

Dr. E. Emmert, Bern.

Unter dem 15. April dieses Jahres sandte ich an eine grössere Zalh von Augenärzten ein Circular, welches seitdem auch im *Centralblatt für praktische Augenheilkunde* von Herrn Hirschberg durch dessen Güte abgedruckt worden ist. In diesem Circulare nahm ich mir die Freiheit darum zu bitten, zum Zwecke einer Statistik über die Häufigkeit der Ophthalmia neonatorum, der Conjuntivitis diphtheretica und der Hopopyon-Keratitis in den verschiedenen Monaten des Jahres, die Zahl der in den Jahren 1870-1880 beobachteten Fälle dieser Krankheiten in die verschiedenen Abtheilungen desselben einzutragen, wobei es selbstverständlich Jedem überlassen werden musste so viele Jahrgänge zu dieser Statistik zu verwenden als er konnte und wollte.

Da der Versuch zu einer solchen Statistik durchaus nicht nur localer Natur sein, sondern im Gegentheil möglichst weitverbreiteten Verhältnissen Rechnung tragen sollte, waren Circulare in alle Länder versandt worden. Die erhaltenen Resultate sind dadurch internationale geworden. Es dürfte daher gerade hier, wo so verschiedene Nationen vertreten sind, der Ort sein, über das Gewonnene Bericht zu erstatten.

Von 24 Collegen erhielt ich auf den gewünschten Termin, d. h. auf 1. Juli d. J. die Circulare ausgefüllt wieder zurück. Ich spreche denjenigen unter ihnen

welche dieses gethan und hier anwesend sind, meinen verbindlichsten Da
Diese 24 Collegen sind: In Deutschland: Alexander (Aachen), Bäuerlein
burg), Betke (Bremen), Haase (Hamburg), Hänel (Dresden), Höring (Ludwi
Landsberg (Görlitz), Michel (Würzburg), Mooren (Düsseldorf), Rheindorf
Sattler (Erlangen), Seggel (München), Stoer (Regensburg); in Oesterreich: B
(Triest), Schenkl (Prag), Stellwag (Wien); in der Schweiz: Pflüger (B
Frankreich: Gayet (Lyon); in Italien: Ponti (Parma); in Spaniem: C
Aragó (Barcelona); in Russland; von Becker (Helsingfors), Hirschmann (Cl
Schmid (Odessa).

Sie vertreten, mich selbst inbegriffen, zusammen 182 Jahre. Acht von
zwanzig gaben auch die Zahl der Kranken an, auf welche sich ihre Mitth
bezogen; so Bäuerlein 30,000, Betke 19,017, Hänel 5668, Landsberg 3607,
56,969, Stellwag 17,000, Ponti 4520, v. Becker 6286, zusammen 143
dass wohl angenommen werden darf, dass die Gesammtzahl aller Kran
welche meine Statistik sich stützen soll, sich auf wenigstens 300,000
wird. Unter diesen wurden 2932 Fälle von Ophthalmia neonatorum,
Conjunctivitis diphtheritica und 3431 von Hypopyon-Keratitis beobachtet.

Indem man die Gesammtresultate in Curven überträgt, lässt sich F
aus ihnen herauslesen:

1.—Die Ophthalmia neonatorum hat ihr Maximum, 270 Fälle, im Mo
ihr Minimum, 190 Fälle, im Monat December. In die Monate Januar
263, und September 261 Fälle fallen geringere Ansteigungen und vor
September hinweg findet eine fortwährende Abnahme statt.

2.—Die Conjunctivitis diphtheritica erreicht ihr Maximum, 24 Fälle, in
Minimum, 12 Fälle, im August und hat im Juni 29 und November
Man kann schlechtweg sagen, dass von Monat August an die Zahl d
von Conj. diphth. unter Schwankungen stets wächst bis Januar, und von d
unter einmaliger bedeutender Ansteigung im Juni, abnimmt bis August.

3.—Die Hypopyon-Keratitis zeigt ihr Maximum, von 411 Fällen im
ihr Minimum, 191 Fälle, im December, verhält sich daher, was gev
interessant, gerade umgekehrt zur Conj. diphtheritica.

Dass die Zahl der Fälle von Hypopyon-Keratitis in den Monaten J
und August am grössten, ist, für Deutschland wenigstens, schon lange
nicht so für andere Länder, ebensowenig, dass vom Monat December
die Zahl der Fälle beharrlich zunimmt, von Monat August an dage
kurzer Wiederansteigung im October ebenso beharrlich abnimmt.

Es schien mir nun nicht uninteressant zu untersuchen, wie sich die H
genannter drei Krankheiten in den einzelnen Ländern verhalte, aus
ausgefüllte Circulare mir zugegangen waren; konnte man doch von vornl
die Möglichkeit denken, dass die verschiedenen Länder, kältere und v
nördlichere und südlichere, Verschiedenheiten in der Häufigkeit dieser Kra
in den einzelnen Monaten darbieten würden. Und in der That lassen di
fenden Länder, Deutschland, Schweiz, Russland, Frankreich, Italien,
besonders bei Umwandlung der für sie gefundenen Zahlen in Curve
Eigenthümlichkeiten in unzweideutiger Weise hervortreten. Bei der f
Zusammenstellung sei mir gestattet Triest zu Italien zu zählen.

Der Kürze und Uebersichtlichkeit wegen bezeichne ich die Ophth. neonat. mit I., die Conj. diphth- mit II., und die Hypop.-Keratit. mit III. Es fanden sich die

MAXIMA DER

I	II	III
in Russland im Januar 60, Mai 58, Sept. 59 Fälle	Feb. 4, März 4 Fälle.	Juni 38 Fälle
„ Spanien „ März 22, November 22 Fälle	April 3, Juli 3 „	Feb. 38 „
„ Italien „ Mai 144 Fälle	Juni 1 „	Juni 144 „
„ Frankreich Zu wenige	Fälle.	Juli 16 „
„ Schweiz „ Juni 24 Fälle	Juni 6 „	Juli 14 „
„ Deutschland „ Juli 158 Fälle	Jan. 16 „	Aug. 184 „
(Deutsch. Reich und Oesterreich)		

MINIMA DER

I	II	III
in Russland im Juli 22 Fälle	Juli 0 Fälle.	Nov. 18 Fälle
„ Spanien „ Juni 11 „	Feb., März, Mai, Juni, Oct., 0 Fälle	Sept. 20 „
„ Italien „ Dec. 61 „	Alle übrigen Monate 0 Fälle	Dec. 61 „
„ Frankreich Zu wenige	Fälle.	Oct. 2 „
„ Schweiz im Dec. 11 Fälle	April 1 Fall	März 4 „
„ Deutschland im Dec. 93 „	August 5 Fälle	Nov. 76 „
(Deutsch. Reich und Oesterreich)		

Sehr bemerkenswerth ist bei diesen Resultaten die Vertheilung der Maxima und Minima auf verschiedene Monate in den einzelnen Ländern. Ich mache besonders darauf aufmerksam, wie die Ophth. neonat., welche durch eine ziemliche Zahl von Fällen vertreten ist, ihre Maxima in jedem Lande in einem andern Monat zeigt, und wie in eben der Reihenfolge, in welcher wir die verschiedenen Staaten geordnet haben, das Maximum in immer spätere Monate fällt, dass ferner Russland und Deutschland sich sowohl hinsichtlich der Maxima, als der Minima umgekehrt verhalten, Russland nämlich sein Maximum von Fällen im Januar, Deutschland im Juli, Russland dagegen sein Minimum im Juli, Deutschland im December hat; dass ebenfalls bezüglich der Ophth. neonat. Russland und Spanien weit mehr Aehnlichkeit miteinander, als mit den anderen Staaten haben, so, dass bei ersteren beiden die Maxima ganz in den Anfang des Jahres, die Minima in die Mitte, bei letzteren die Maxima in die Mitte des Jahres, die Minima an's Ende fallen; dass dagegen für die Conj. diphth. Russland und Deutschland sich sehr nahe stehen, und bei der Hypopyon-Keratitis Spanien sein Maximum bereits im Februar erreicht, Russland und Italien es im Juni, Frankreich und die Schweiz es im Juli haben, während es für Deutschland erst in den August fällt.

Schmid in Odessa verdanke ich Mittheilungen über die, von ihm während der Jahre 1877–80 beobachtete, Conjunctivitis epidemica. Diese Erkrankung scheint einen fast zweijährigen Typus zu haben.

Im Jahre 1877 war sie am stärksten, im April 13, August 13, und September 13 Fälle und war ganz verschwunden während der Monate November und December.

Im Jahre 1878 traten nur wenige sporadische Fälle auf im April, Juli und September.

Im Jahre 1879 erlangte die Epidemie im Monat September mit 24 und besonders October mit 32 Fällen, eine nie erreichte Höhe, nachdem in den Monaten März, Mai, Juni, Juli, August gar keine Fälle vorgekommen waren.

Im Jahre 1880 trat eine kleine Epidemie im Februar (7 Fälle) auf, während in den übrigen Monaten keine oder nur sehr wenige Fälle zu verzeichnen waren.

Interessant sind auch die Mittheilungen, welche wir von Horner durch die Diss. des verstorbenen Medicin studirenden Kendall aus Boston über die Häufigkeit des Herpes cornea catarrhalis in den verschiedenen Monaten der Jahre 1874–

1879 und der Neuralgia supraorbitalis intermittens aus den Jahren 1860-1879 durch die Diss. des Herrn v. Mandach erhalten.

Aus diesen geht hervor, dass der Herpes corn. catarrh. unter bedeutenden Schwankungen von Januar bis November an Häufigkeit abnimmt, sein absolutes Maximum, 14 Fälle, im Juli, daneben aber im Januar und October nochmals fast gleiche Höhe, 13 Fälle, erreicht.

Ungleich charakteristischer durch die Zeit ihres Auftretens ist die Neuralgia supraorbitalis intermittens, welche ein absolutes Maximum, 15 Fälle, im Februar zeigt und allmählig bis October auf ihr fünfzehn Mal geringeres Minimum, 1 Fall, herabsinkt.

Diese Zusammenstellung von sechs verschiedenen Erkrankungen des Auges, der Ophthalmia neonatorum, der Conjunctivitis diphtheritica, der Hypopyon-Keratitis, der Conjunctivit. epidemica, des Herpes corneæ catarrhalis und der Neuralgia supraorbitalis intermittens, beweist auf das Unzweifelhafteste, dass jede dieser Krankheitsformen ihre so zu sagen characteristischen Zeiten ihres hauptsächlichen Auftretens und Verschwindens hat. Die Einen fallen mehr in die Sommer—die anderen mehr in die Wintermonate; es spielen somit höchst wahrscheinlich meteorologische Einflüsse eine grosse Rolle. Als ebenso sicher festgestellt darf betrachtet werden, dass, gerade in Folge des so wahrscheinlichen Einflusses meteorologischer Verhältnisse, die verschiedenen Länder, je nach ihrer geographischen Lage und geologischen Bodenbeschaffenheit, Verschiedenheiten in Bezug auf häufigeres oder selteneres Auftreten einer Krankheit überhaupt, sowie auch ihrer Zu-und Abnahme zu verschiedenen Jahreszeiten darbieten. Ferner ist anzunehmen und für einzelne bewiesen (vgl. die Conj. epidemica), dass, wahrscheinlich aus den nämlichen Gründen an ein und demselbem Orte in verschiedenen Jahren, ein und dieselbe Krankheit bedeutenden Schwankungen in Bezug auf Häufigkeit ihres Auftretens, Intensität und Zahl der Fälle unterworfen ist. Endlich ist es auch in hohem Grade wahrscheinlich, dass noch viele Augenkrankheiten als von meteorologischen Einflüssen abhängig zu finden sein werden.

Sind wir schon jetzt so weit zu wissen, dass manche Erkrankungen des Auges mit der Bildung von Mikroorganismen einhergehen, welche wahrscheinlich nicht Folge, sondern Ursache der betreffenden Krankheiten sind, so ist es einer vielleicht nicht zu fernen Zeit vorbehalten die specifischen Krankheitserreger kennen zu lernen, welche entweder besondere Arten oder nur verschiedene Entwicklungsstufen ein und desselben Organismus sind.

Diese noch mangelnde Kenntniss der specifischen Krankheitserreger kann uns jedoch nicht abhalten darnach zu forschen, welche Krankheiten meteorologischen Einflüssen, und welchen meteorologischen Einflüssen sie unterworfen sind. Es wird im Gegentheil das eventuelle Auffinden von Mikroorganismen und ihrer specifischen Eigenthümlichkeiten erleichtern, wenn bereits bekannt ist, unter was für äusseren Einflüssen sie am häufigsten vorkommen. Würden alle Diejenigen, welche Jahresberichte schreiben, statt die ziemlich werthlose Gesammtzahl jeder einzelnen Krankheit zu berechnen, sich die kleine Mühe nehmen anzugeben, wie viele Fälle jeder Krankheitsform in jedem Monat des Jahres beobachtet wurden, so könnte dadurch schon eine recht nützliche Statistik erzielt werden, welche noch bedeutend an Werth gewinnen würde, wenn Operationen und Operationserfolge, ganz besonders die Staaroperation, in derselben Weise berücksichtigt würden.

Allerdings muss zugestanden werden, dass damit noch nicht Alles erreicht und namentlich der Meteorologie nicht hinreichend Rechnung getragen wäre; sollte

dieses der Fall sein, so müssten die bestehenden Barometerstände, Temperaturverhältnisse, Windrichtungen u. A. mit angemerkt werden.

Die Gelegenheit Solches zu thun ist allerdings gegenwärtig beinahe überall gegeben durch die für viele Orte täglich ausgegebenen Witterungsbülletins, aber es würde hier wohl gehen wie überall—wo zu viel gefordert wird, wird nichts erreicht.

Es genügt vorläufig eine Statistik in der angegebenen Weise zu erhalten. Hierüber Kenntniss zu erlangen, das ist die Hoffnung, welche ich zum Besten unserer in allem Uebrigen so weit vorgeschrittenen Wissenschaft an die gemachten Mittheilungen knüpfe.

DISCUSSION.

Dr. DE WECKER, Paris, who opened the discussion at the request of the President, said :—I cordially agree with the weighty and very practical advice given us by Prof. Horner, and I especially admire his caution as to the results which statistics afford us. I am a thorough partisan of the antiseptic method, but would call attention to the contradictory evidence which my own statistics afford, if I confine myself to the results for the last 18 months. During last year I extracted 250 cataracts under strict antiseptic precautions, and I had only one single suppuration. I thought that I had succeeded in abolishing this, the opprobrium of all operations for cataract. But, unhappily, in the first six months of the present year, under precisely the same conditions and methods of antisepsis, I have had 7 suppurations in 150 cases, a result almost as bad as any before the days of antiseptics. If the numbers were differently manipulated a still more striking difference might be shown; thus, I performed 200 extractions between the month of August, 1880, and the end of the year, without a single suppuration, an apparent triumph for the antiseptic method; and yet, as above stated, 7 suppurations have occurred in 150 cases during the present year. Again, if all the cases in the 18 months be added together (1880, 250; first 6 months of 1881, 150), we have a total of 400 with 8 suppurations, giving 2 °/₀, or exactly the same proportion as with the old dressings. An exact estimation of the antiseptic method can be arrived at only by examining the returns for a number of years. Whenever the antiseptic method fails to give us the results of which it is clearly capable, we must, however disagreeable it may be, blame the imperfect execution of the method. I think that the sincere thanks of the meeting will be due to Prof. Horner, if by his valuable indications he has simplified the details of the method.

Dr. WARLOMONT, Brussels, thought that the antiseptic method ought not to be applied as a rule in cataract operations. It seemed to him not yet proved that the prevention of suppuration by this method is not more than counterbalanced by the irritating properties of the agents used. It would perhaps be different if a non-irritating antiseptic substance were discovered. At present he thought that the method should be reserved for cases where unfavourable conditions are present either in the patient or in his surroundings.

Dr. GAYET (Lyons) :—I am a strong adherent of the antiseptic method, but although I have employed it with care in operations on the eye, I have had no marked success. I attribute this want of success to the agent (carbolic acid) used, which, even in weak solution, is hurtful to the conjunctiva. Some other substances must be found in its stead, for the method must on no account be given up.

Dr. KNAPP, New York:—Watching very closely, for years, the reactive processes after extraction, I have been able to account for almost all of them by a physical injury done to the parts involved. In the vast majority of instances I have seen the inflammation arise from the corners of the wound, which suffer most from the pressure of the knife and of the emerging lens, and where particles of cataract are stripped off and remain in the wound, often together with shreds of capsule and iris. Scarcely twice in a hundred cases have I been able to trace the origin of the inflammation to the centre of the wound. These observations have prevented me from being a ready convert to the current views of sepsis in eye surgery. If the centre of the flap, the broad avenue for admission of disease germs, is so rarely the seat of origin of inflammation, whereas the narrow corners almost always prove the starting point of all kinds of reactive processes, infection from outside cannot be considered as their cause. Moreover, if you attack with a needle, never so scrupulously cleaned, an old tough pupillary pseudo-membrane, you may see plastic and suppurative irido-cyclitis ensue: nobody will make infection responsible for this result. I have performed the most extensive operations in the orbit, removal of exostosis where several of the neighbouring cavities were implicated, extirpation of sarcomata and other growths where the malar antrum, the nasal passages, the frontal sinuses, the ethmoid and even the sphenoid cells were opened and portions of the roof of the orbit removed, so that the pulsations of the brain were visible across the room, and yet the recovery was free from fever, from swelling of the neighbouring parts, and from suppuration. I will not cite any further examples, but I desire to say that for 2½ years I did not see one case of suppuration in any operations performed on the eye at the Institution which is under my charge, and over 1,000 operations, of course not all extractions, were made during the period, all without antisepsis; then, after that, three cases of suppuration occurred. I am far from denying the existence of infection, the cases of dacryo-cysto-blennorrhœa, for instance, prove it clearly enough; I only cannot share the views of those who believe that infection is the most powerful, if not the only, cause of severe inflammation and suppuration in the eye, and who consequently ascribe to antiseptic treatment such a paramount importance in ophthalmic surgery.

Dr. GALEZOWSKI, Paris:—I agree completely with the statements of Prof. Horner, even though the results are sometimes but little encouraging. Referring to Dr. de Wecker's unsatisfactory results in the present year, I state as my own experience, that, whilst during the two years before this, I had only 2 °/₀ or 3 °/₀ of suppurations, this year I have had 5 suppurations in 93 cases. The existence of an epidemic influence is all the more reason for the strictest employment of antisepsis. The following fact appears to me significant:—I used the same knife for two extractions of cataract and one iridectomy in irido-choroiditis, and all three cases went into suppuration. I think, then, that the same knife ought not to be used for more than one patient. I think that statistics have practical value only when care is taken to separate soft cataracts, congenital cataracts, &c., from senile cataracts.

Dr. HERMANN PAGENSTECHER, Wiesbaden:—I am a strong advocate of antiseptic dressings in eye surgery. Two points, mentioned by Prof. Horner as especially predisposing to septic suppuration, are particularly interesting; viz., the influence of fragments of lens matter left behind and loss of vitreous. Having had a very long experience of extraction of the lens in its capsule for many years without, and for many years with, antiseptic precautions, I have not

the least hesitation in asserting that the losses have decreased very much under the latter method. Loss of vitreous, as is well known, is not uncommon in extraction with the capsule, yet I can affirm that, since the adoption of full antiseptic precautions, I have never seen so-called primary suppuration of the vitreous, *i.e.*, yellowness of its anterior part leading to panophthalmitis, a result often seen before antisepsis was known. Iritis has also diminished in the same marked manner. I use carbolic spray of 2 to 2½ %, and proportionately strong carbolic water for the dressings. It is essential that the purest and best acid be used. Cleanliness is an essential point. I have seen no cases in which I felt sure that the antiseptics had any bad influence on the healing of the wound, on the iris, or on the vitreous; but sometimes conjunctival irritation occurs. I feel no doubt that the adoption of this method will spread in ophthalmic surgery, though, doubtless, some time will elapse before the antiseptic best suited for the eye is found and generally recognized.

Prof. Dor, Lyons:—The employment of antisepsis is absolutely necessary in certain special cases—*e.g.*, when there is dacryocystitis or during epidemics of erysipelas, &c. It is important not to keep the dressing on if it prevents inspection of the wound. On the other hand, it is advisable to examine the parts often. Antiseptic precautions are always favourable, but the spray may be omitted.

Prof. Horner, Zurich, in reply, said:—I am quite in accord that statistics have significance only when they extend over a considerable time. Mine reach from 1867–1881, and they show, through antisepsis, a gradual improvement of results from 6·6 % to 1·1 %. Therefore I put it prominently forward, once again, that I operate under much more favourable circumstances of late than previously. Like Dr. Gayet, I attach great importance to the quality of the antiseptics employed; I do not find the use of good carbolic acid to be attended with danger. Though a skilled operator may obtain brilliant results in a good atmosphere without the use of antiseptics, yet he, and still less anyone of slight experience, can never attain them in large hospitals and under unfavourable circumstances.

Des Mouvements des Yeux à l'état normal et à l'état pathologique.

Dr. Landolt, Paris.

Les mouvements des yeux sont des rotations autour d'un centre immobile. Tout mouvement de l'œil et tout défaut de mouvement, ou de direction de l'œil (*strabisme*) trouve donc son expression dans un arc, dont le centre est le centre de rotation, et comme tel, il est mesuré par des degrés.

L'auteur mesure les excursions des yeux à l'aide de son périmètre, au centre duquel il place l'œil observé (autant que possible, son centre de rotation). La tête est immobilisée par une plaque en bois tendre, dans laquelle le patient mord. On lui fait suivre un objet de fixation, visible seulement par la fosse centrale, qu'on promène le long de l'arc dans tous les méridiens. Les points limites sont marqués sur un schema, comme le champ visuel. Par leur réunion on circonscrit le champ des excursions des yeux, pour lequel l'auteur a adopté le nom de "champ de fixation" (*Field of fixation, Fixirfeld*) au lieu de "champs de regard" (*Blickfeld*).

Le champ de fixation s'étend, à l'état normal, au minimum à 45° dans toutes les

directions, à l'exception de la direction inféro-interne, où il est restreint par le nez, et quelquefois en haut, où le bord orbitaire supérieur le limite. La grandeur et la forme de l'œil relativement à celles de l'orbite peuvent avoir une influence sur l'étendue et la forme du champ de fixation. C'est ainsi que Donders et Schuurmann ont trouvé le champ des myopes moins étendu que celui des emmétropes et surtout des hypermétropes. L'auteur a constaté des différences analogues, et en démontre des spécimens. Mais les exceptions sont très fréquentes, attendu que la grandeur du globe n'est pas le seul facteur capable de modifier les mouvements d'un œil. L'insertion et la force des muscles doivent y contribuer beaucoup.

(Les courves pointillées de la figure 2 donnent des spécimens des champs de fixation moyens pour les deux yeux.)

Le champ de fixation binoculaire est mesuré à grande distance à l'aide de la division en tangentes d'une paroi et du plancher de la salle de consultations. Les yeux peuvent être considérés comme réunis au centre de cette sphère. L'un est couvert d'un verre coloré bombé. Une flamme est promenée le long des différents méridiens de la division. La personne examinée indique jusqu'à quelle limite elle voit les deux flammes réunies (Fig. 1).

Fig. 1.

Ce champ de fixation binoculaire n'est pas schématique.
Il appartient à un cas donné.

L'auteur a étudié à l'aide de ces méthodes toutes les formes de troubles de la motilité des yeux :

1. *Insuffisances des droits internes et externes.*—Les champs de fixation monoculaires peuvent être normaux, et le champ binoculaire seul est restreint. Dans l'insuffisance interne, il se manifeste à droite et à gauche une diplopie croisée, dans l'insuffisance externe, une diplopie homonyme. Dans d'autres cas, les champs monoculaires sont limités en dedans dans l'insuffisance des internes (Fig. 2), en dehors dans l'insuffisance des externes. (Démonstrations de plusieurs champs de fixation monoculaires et binoculaires d'insuffisance des droits internes et externes avec myopie et hypéropie.)

2. *Strabisme non-paralytique.*—C'est à tort qu'on veut expliquer tout strabisme par un vice de réfraction. Il faut chercher la cause ailleurs, et commencer par

l'étude de la motilité des yeux. Ici encore, on rencontre des différences considérables entre des cas en apparence semblables.

Il existe des strabismes alternants, convergents et divergents, avec des champs de fixation monoculaires normaux. (Démonstration.)

Fig. 2.

Œil gauche. Œil droit.

. . . Champ de fixation normal minimum.
——— Champ de fixation d'une insuffisance des mm. droits internes.

Dans d'autres cas de strabisme alternant, les champs des deux yeux sont restreints dans le sens du strabisme. (Démonstration.)

Dans le strabisme monoculaire non paralytique, les deux champs de fixation peuvent être intactes. D'autres fois on rencontre dans ce cas un rétrécissement

Fig. 3.

Champs de fixation de deux yeux gauches.

. . . Parésie du droit externe avec strabisme convergent de 15°.
——— Strabisme convergent non paralytique de 50° datant de la première jeunesse. Œil amblyope. Individu âgé de 50 ans.

opposé à la direction du strabisme dans les deux champs monoculaires. (Démonstration.)

Il arrive même que le champ de l'œil dévié est limité dans toutes les directions. (Démonstration.)

Lorsque le strabisme a existé longtemps sur le même œil, on trouve généralement un rétrécissement très-marqué du champ de fixation. Ce rétrécissement diffère de celui produit par une paralysie musculaire. (Fig. 3.)

3. *Strabisme paralytique.*—Ici le champ de fixation est des plus caractéristiques. Un regard jeté sur le schema suffit pour savoir quel est le muscle atteint, et jusqu'à quel degré il est parésié. Dans le cas de paralyse totale, la comparaison du champ de fixation altéré avec le champ normal, donne les indications les plus précieuses sur le mode d'action du ou des muscles paralysés. (Démonstrations de champs de fixation de parésies et paralysies du droit externe (Fig. 3); de l'oblique supérieur, du moteur oculaire commun.)

L'auteur insiste sur la fréquence avec laquelle on rencontre simultanément la paralysie du moteur oculaire commun avec la parésie de l'abducens et de l'oblique supérieur.

De plus, il observe, que très-souvent la paralysie totale de la troisième paire d'un œil est accompagnée de troubles dans le domaine du même nerf de l'autre côté. (Fig. 4.)

Fig. 4.

Œil gauche. Œil droit.

. . . Champ de fixation moyen.

——— Champs de fixation des deux yeux de la même personne atteinte de parésie de presque tous les muscles des yeux.

Thérapeutique.—Dans le traitement des troubles de motilité des yeux, il faut toujours avoir en vue le but suprême, qui n'est pas seulement de redresser un œil au point de vue cosmétique, mais de rétablir la vision binoculaire.

Ce but serait atteint infiniment plus souvent, si, basé sur un examen approfondi du cas (mensuration de l'angle du strabisme et des champs de fixation, &c.), on faisait coopérer tous les moyens de traitement dont nous disposons.

Pour favoriser la vision binoculaire, on égalisera la réfraction des deux yeux pour la distance à laquelle elle sera le plus facilement obtenue. On augmentera la

vue de l'œil dévié par la correction de son astigmatisme et par des exercices avec exclusion de l'autre œil.

S'il le faut, on corrigera le strabisme par l'opération : ténotomie ou ténotomie avec avancement, ou ténotomie sur les deux yeux, &c. Seulement il faut se rendre compte de l'effet que ces opérations peuvent donner.

L'auteur a constaté que, dans les meilleures conditions, une ténotomie ne donne pas plus de 15° de correction. Il a étudié l'effet des opérations des muscles de l'œil à l'aide du champ de fixation et il fait voir des spécimens des plus curieux, de champs de fixation avant et après ténotomie, avant et après avancement musculaire. Après l'opération on aura recours aux exercices gymnastiques. Ils peuvent être infiniment variés.

Lorsqu'il n'y a pas de diplopie, on la provoquera à l'aide des méthodes connues ; puis on se servira des exercices stéréoscopiques dans le genre de ceux que M. Javal a indiqués.

L'auteur se sert d'un stéréoscope ordinaire, dont le couvercle peut être muni de verres de nos boîtes d'essai. Il n'emploit généralement pas de prismes, mais il munit chaque œil du verre nécessaire pour voir à la distance des objets.

Ces derniers consistent en deux lignes verticales, dont l'une coupe la moitié inférieure, l'autre, la moitié supérieure du champ présenté à chaque œil. Par leur réunion stéréoscopique elles ne forment qu'une seule ligne. Ce résultat est obtenu par l'écartement ou le rapprochement dans le stéréoscope des cartons qui portent les lignes. Le stéréoscope ainsi employé vient puissamment en aide à l'opération dont il peut augmenter ou diminuer l'effet.

Enfin l'auteur cite des cas de rétablissement de la vision binoculaire, par la combinaison de l'opération avec la correction de l'amétropie, les exercices visuels et stéréoscopiques, où on ne l'aurait jamais obtenu avec un des procédés seulement, à cause de l'ancienneté et du haut degré du strabisme, et de la différence considérable de réfraction et d'acuité visuelle qui existe entre les deux yeux.

Ténotomie partielle des Muscles de l'Œil pour combattre l'Insuffisance musculaire.

Dr. Ch. Abadie, Paris.

L'insuffisance des droits internes est fréquente chez les myopes; elle est ordinairement associée à la progression de la myopie et précède l'apparition de lésions profondes de l'œil, choroïdite atrophique diffuse, choriorétinite de la région de la macula, décollement de la rétine. Cette insuffisance joue probablement un certain rôle dans le développement des altérations qui frappent le segment postérieur de l'œil, aussi, il y a un intérêt majeur à la combattre aussitôt que possible.

Lorsque l'insuffisance des droits internes commence à se manifester et à se traduire simplement par les symptômes de l'asthénopie musculaire, on n'a d'autres ressources que de donner des verres prismatiques à base intense. Ce moyen est d'ordinaire insuffisant; si l'on opère la ténotomie complète des droits externes, même en suturant énergiquement la conjonctive, on risque de dépasser la mesure et d'avoir un strabisme convergent. C'est dans ces cas que la ténotomie partielle m'a rendu de grands services.

Chez les emmétropes et même les hypermétropes, on peut rencontrer de l'insuffisance des droits internes assez accusée pour provoquer de l'asthénopie musculaire

(j'en ai observé plusieurs exemples); dans ces cas-là encore la ténotomie partielle des droits externes est indiquée et donne de bons résultats.

Le manuel opératoire est le même que pour la ténotomie complète sauf qu'on respecte quelques fibres tendineuses médianes. On peut, si on le désire, affaiblir considérablement le muscle en ébarbant avec les ciseaux les parties supérieures et inférieures qui ont été détachées. Dans les cas de myopie progressive avec tendance au strabisme divergent, si le lendemain de l'opération on reconnaît que la correction est insuffisante, il est facile de la compléter en achevant de sectionner les fibres qu'on avait ménag ées.

Un Ophtalmomètre.

Présenté par MM. Javal et Schiötz, Paris.

Qui leur sert à mesurer l'astigmatisme cornéen avec une précision et une rapidité extrêmes. Partant de l'ophtalmomètre de Helmholtz, les auteurs ont voulu:

1.—Supprimer l'erreur de collimation, ce qui est obtenu en ramplaçant les plaques héliométriques par un cristal bi-réfrigent;

2.—Supprimer tous les calculs et permettre de lire immédiatement en dioptries la réfraction de chaque méridien;

3.—Diminuer le nombre des lectures pour chaque position, en augmentant assez la précision de l'instrument pour qu'on ait toute sécurité en se bornant à une seule lecture;

4.—Quand on recherche seulement l'astigmatisme, permettre de trouver immédiatement les méridiens de courbure maxima et minima, ce qui réduit dans une mesure énorme le travail à faire dans ce cas particulier, qui est le cas ordinaire;

5.—Rendre inutile l'emploi d'une chambre spéciale, en disposant les choses de manière à pouvoir travailler en plein jour;

6.—Diminuer suffisamment les dimensions de l'instrument pour qu'il soit facile de le poser, tout prêt à fonctionner, sur une table quelconque;

7.—Réduire d'au moins moitié son prix, condition tout-à-fait nécessaire pour vulgariser l'emploi de cet indispensable instrument.

Au cours de leurs recherches, MM. Javal et Schiötz ont trouvé que dans un grand nombre de cas, l'astigmatisme cornéen diffère peu de l'astigmatisme total; ils ont démontré l'existence d'un astigmatisme latent, devenant peu à peu manifeste avec les années.

Pour plus de details, voir *Annales d'Oculistique*, numéro de juillet-août 1881, et suivants.

Dans la séance du 8 aout, M. Javal a donné des explications complémentaires plus spécialement destinées aux confrères qui avaient fait acquisition de l'instrument. Ces détails sur l'emploi du nouvel ophthalmomètre sont répétés dans la brochure qui est adressée à toute personne qui en fait la demande à M. Laurent, opticien, 21, rue de l'Odéon (Paris).

Sympathetic Ophthalmitis, the Mode of its Transmission, and its Nature.

Prof. H. Snellen, Utrecht.

Sympathetic ophthalmitis belongs to the most serious diseases; the physiological explanation of its nature has been an open problem ever since it was first observed.

Our knowledge of this disease is of recent date. We find it mentioned in 1830, by Mackenzie, in the first edition of his "Practical Treatise on the Diseases of the Eye," p. 480. He says:—"We sometimes meet with severe sympathetic inflammation in the eye which has not received the injury." In the second edition of the same book, 1844, Mackenzie relates a couple of cases, which he describes with an accuracy and completeness, to which, from a clinical point of view, the knowledge of our present day has but little to add. Later literature yields an abundance of clinical observations proving that this disease is relatively not uncommon. Dr. Joseph Schneider,* in gathering together all published observations, compiled, up to 1880, 758 cases, of which 69 were caused by operative treatment.

With regard to the physiological interpretation of the nature of sympathetic ophthalmia, Mackenzie suggested that the transmission of inflammation from the one eye to the other is to be sought either by reflective nervous action through the ciliary nerves, or, propagated *per continuitatem* through the optic nerves along the chiasma.

The hypothesis of transmission by reflective nervous action has been till lately the most generally adopted. The phenomena here observed were even utilized as a proof of the direct trophic action of the nervous system on the nutrition of the tissues. Sympathetic ophthalmia on this hypothesis was regarded as an analogue of the neuro-paralytic sloughing of the cornea after division of the trigeminus, and also as analogous to the keratitis, consecutive to herpes zoster of the frontal nerve. Both of these analogical types have lost their value as proofs of the trophic influence of nervous action. I succeeded, 24 years ago,† in proving that ophthalmitis after division of the trigeminus is not a neuro-paralytic phenomenon, but the result of injury of the anæsthetic eye. After cutting the trigeminus of a rabbit and closing the eye and fastening the sensitive ear before the anæsthetic face, I prevented traumatic influence, and hereby annihilated neuro-paralytic inflammation. In the same way herpetic keratitis has ceased to stand as a proof of nervous nutritive action; the pathologico-anatomical researches by Wyss,‡ in Zurich, having shown convincingly that herpes zoster consists in continuous inflammation of the nervous fibres, propagating itself to the final ramifications of nervous tissue in the epidermis of the skin and the epithelium of the cornea.

After withdrawing these interpretations of analogical processes, to attribute sympathetic cyclitis to reflective nervous action makes of it an isolated fact, and as such it is apparently not beyond distrust. The origin of nervous irritation was sought in incarceration of ciliary fibres in the cicatrix of the sclerotic; but in many cases such compression is not to be seen. That sometimes symmetrical parts of both eyes are affected has been accepted as another proof of nervous action,

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* Inaug. Dissert., Wurtzburg. *Hirschberg's Centralbl.* 1880. P. 136.

† H. Snellen, "De invloed der zenuwen op. de ontsteking." Utrecht. 1857.

‡ Wyss, Beiträge zur Kenntniss des Herpes zoster: *Wagner's Archiv*, xii. p. 261.

but this also is not without many exceptions, and may be assigned to accidental occurrence. Reflective and irradiant nervous action can undoubtedly produce sympathetic irritation of other parts, and sympathetic neurosis of the eye may be ascribed to nervous irritation.* Neurosis is not sympathetic inflammation: both may coincide, but the one need not be the sequel of the other. Sympathetic neurosis, manifesting itself by watering of the eye, photophobia, irritation, and even temporary anopsia, finally disappears after extirpation of the injured eye,* and may be attributed to reflected ciliary action. It seems probable that, for sympathetic inflammation, a different path of transmission is to be sought.

Sympathetic inflammation never occurs before a characteristic process has developed itself in the eye first injured. It never appears earlier than two or three weeks after the injury; and mostly later, sometimes only after years. The sight of the eye first injured is always considerably lessened. We constantly observe iritis, cyclitis, choroiditis, with obscuration of the pupil and of the vitreous humour.† In the beginning the tension is lessened, but it constantly increases before the second eye is affected. The increase of tension proceeds from the posterior part of the eye. The iris is drawn forwards, and on anatomical investigation of the extirpated eye, we find the iris impregnated and covered by solid exudation. The vitreous humour, and with it, partly or totally, the retina, is often drawn forward into a funnel shape,‡ the apex of the funnel, remaining attached to the optic nerve, seems to pull forward its tissue. We may conclude that the lymphatics through the iris and the anterior parts of the eye are closed, whilst those of the posterior part of the eye are becoming dilated. The pathological changes in the uveal tissue are characteristic. In all cases of extirpation of the globe, where sympathetic inflammation has already arisen, and in many cases where apparently it was imminent, we find the uveal tissue thickened, impregnated and covered with lymphoid cells and granular masses. These lymphoid cells and granules are spread through all the tissues of the posterior part of the globe.

The anatomical changes that we observe may be grouped into two series:—(1), The dilatation of the posterior lymphatic spaces; and (2), an infective plastic inflammation of the uveal tissue. I suggest that both factors must coincide to produce the secondary affection of the other eye. This may explain the great differences of time occupied in the extension of the process in different cases. The lymphatic vessels are the most probable paths along which the affection can be transmitted from the first eye to the other. The perichoroidal spaces are constantly partly dilated.§ The tissues around the optic disc are found impregnated with lymphoid cells. Professor MacGillavry,‖ of Leyden, was the first to show, as has been lately repeatedly stated, that the same lymphoid cells are to be found in the subdural lymph space of the optic nerve. Max Knies¶ found lymphoid cells infiltrated in the arachnoïd layer over the whole length of *both* optic nerves in a case of serous iritis, not however of traumatic origin. In a case of real sympathetic ophthalmitis,

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* F. C. Donders, *Klin. Monatsbl.*, i. p. 448. Th. Leber, *Arch. f. Ophth.*, xxvi. 2, p. 249.

† A. von Graefe, *Klin. Monatsbl.*, i. p. 447.

‡ Th. Treitel, *Arch. f. Ophth.*, xxvi. 3, p. 83.

§ B. Steinheim, *Knapp's Arch. f. Ophth.*, ix. p. 51.

‖ "Compte rendu, 6me Session du Congrès internat., Amsterdam, 1879," ii. p. 284.

¶ Max Knies, "Bericht Ophth. Ges." Heidelberg: 1879. P. 52. Idem, *Knapp's Arch. f. Ophth.*, ix. p. 1.

where extirpation was succeeded by fatal meningitis, Pagenstecher* found in the sympathising eye, as well as in the injured one, infiltration of the optic disc and surrounding tissue, and of the uvea and vitreous humour with lymphoid cells.

The repeated observations of meningitis after extirpation of eyes with purulent inflammation makes it probable that propagation along the optic nerve into the intracranial cavity may take place. I have observed a case of acute meningitis with acute otitis arising and proceeding simultaneously with, sympathetic ophthalmitis after injury of one eye.—Mr. N., aged 27 years, came to me the 17th of October, 1876, with purulent infiltration of cornea and lens; he had wounded the eye three weeks before, while opening a champagne bottle. On the 8th of November I incised the cornea and let out the lens, as the eye had got hard and painful. We had decided not to extirpate on account of the purulent state of the eye; moreover, we were influenced by the fact that the injury had not affected the ciliary body. A few days afterwards the second eye was injected, and showed decided sympathetic cyclitis. The patient lost his hearing, complained of severe headaches, and grew delirious. On the 23rd of November I enucleated the injured eye. The cerebral functions were slowly restored, but the patient remained totally deaf and totally blind. The remaining eye was painful for some time and became shrunk and atrophic. In this condition the patient continues now, being otherwise in good health. The extirpated eye was given to Professor MacGillavry, of Leyden, who was occupied with his researches on sympathetic ophthalmia, the results of which he gave at the last International Congress at Amsterdam. The retina and the vitreous humour were drawn forward in a funnel-shape; the uvea was considerably thickened and infiltrated with lymphoid cells. Lymphoid cells were abundant in the tissue surrounding the optic disc and in the subdural space of the optic nerve.

Pagenstecher† has published a case of injury where the optic nerve had been torn off, and still sympathetic affection followed. He concludes therefrom against the transmission of the inflammation along the optic nerve. But it seems to me that the suggestion is admissible that the lymphatic communications may be restored through the connective tissues after division of the nerve. The same question arises in those cases where sympathetic inflammation follows optic neurotomy,‡ the operation recommended to replace excision, but of which lately so many discouraging instances have been recorded.

All nerves seem to be surrounded by lymphatic sheaths, and in cases of inflammation one may well expect to find on the ciliary nerves a corresponding inpregnation. Nettleship§ confirmed this lately in his communication to the Clinical Society of London. "In the sections of ciliary nerves a considerable space was often present between the nerve and its fibrous sheath. . . . . In many parts there was a considerable collection or infiltration of cells in the tissue external to the nerves." He reminds us at the same time that Hermann Schmidt|| (of Mar-

* Hermann Pagenstecher, *Klin. Monatsbl.*, xi., p. 123.

† H. Pagenstecher, *Knapp's Arch. f. Ophth.* viii., p. 65.

‡ "Klinische Beobachtungen über die sympathische Ophthalmie. Aus der Graefe'schen Augen-Anstalt zu Halle." Von Dr. Bunge. Dessau, 1880. Th. Leber, *Arch. f. Ophth.*, xxvii. 1, p. 331.

§ E. Nettleship, Three cases of Symp. Ophth.: *Transact. of the Clin. Soc. of London*, vol. xiii. 1880.

|| *Klin. Monatsbl.*, xii. p. 182. 1874.

burg) had stated, in 1874, that of several parts of ciliary nerves whic amined, the nervous fibres were not apparently altered, but when comp normal ciliary nerves, they seemed to contain a greater quantity of cells the fibres.

If it is admitted that transmission of the inflammatory process may occ brain and to the other eye through the lymphatic spaces, the question ari may be regarded as the substantial constituent of the transmitted principl

Leber* suggested last year that meningitis, such as is sometimes after the extirpation of suppurating or inflamed eyes, might be caused by infection. " Als Ursache solcher Vorfälle muss wohl eine Infection der Orbi angenommen werden, welche *in loco* nur zu einer unbedeutenden, der Beol sich entziehenden *infectuösen Entzündung von propagatorischen* Character *vermuthlich durch Venenbahnen* in die Schädelhöhle weiterkriecht . . . Zusammenhang existiren kann, der durch *innerhalb der Venen* fortg unmerkliche Wucherungen parasitärer Organismen bedingt ist." R. Be the first to argue the hypothesis that the inflammation which leads tc thetic affection may also be of parasitic nature; and, following the repres of Leber,‡ he sought the route of the propagation of the infection thr bloodvessels. Presently Leber§ embraced the suggestion of Berlin, so far a the *parasitic* character of sympathetic inflammation, but he pleads for the l system as the route of transmission :—" Es steht deshalb für mich fest sympathische Entzündung eine infectuöse ist, so kann die Fortleitung *n* den Sehnerven erfolgen."

In many wounded eyes, which had led to sympathetic affection, there h observed, besides copious lymphoid cells, granular masses, which might be accumulations of parasitic microphytes. Commonly the necropsy of suc not undertaken without hardening the tissues in chromic acid. Will these masses show motion, if examined fresh, immediately after extirpation of Leber|| is inclined to state this in the affirmative, from an experience of t In a wounded eye, which had produced sympathetic ophthalmitis, he sa optic nerve, as well as in different parts of the globe, the motion of mol different sizes :—"Ihre Grösse ist verschieden und geht bis an die Grenze d barkeit; auch die Form ist ungleich; die Gebilde sind theils isolirt, theils oder mehrere an einander hängend; überall erhält man aber, durch drehende, kreisende Bewegungen und Formveränderungen, den Eind Lebendigen." I repeatedly have had the chance of observing the same phe and may mention the following observation¶ :—C. Brons, a girl of fourte had wounded the right eye by a weaver's shuttle, twenty-one days pr large black cicatrix in the ciliary region; total loss of vision; eye painf touch; other eye normal. I extirpated the globe and removed a suffici of the optic nerve. Immediately afterwards I dissected the eye, cutting the cicatrix, and by the side of the optic nerve, but leaving this untouche was taken to use none but well-cleaned instruments and only newly b

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* Leber, *Arch. f. Ophth.*, xxvi. 3, p. 210.

† R. Berlin, Volkmann's *Sammlung Klin. Vorträge*, No. 185. 1880.

‡ Th. Leber, *loc. cit.*

§ Leber, *Arch. f. Ophth.*, xxvii. 1, p. 331. || Ibid. p. 341.

¶ These observations are being pursued, and will shortly be published.

solution. The first microscopical specimen was taken by scraping the edge of the cut through the cicatrix; the sight of all the moving molecules was striking. All the field of vision was a living mass. Soon we recognized that most of these were pigment molecules of the prolapsed uveal tissue. In the mean time several somewhat larger bodies showed by their ampler movements all the characteristics of micrococci. The same was found all over the choroid. The sheath of the nerve, carefully split, showed moving bodies—apparently micrococci.

What connection the micrococci may have with septic processes—whether they are to be regarded as cause or consequence—is a question that here may be left for the present. However, we may expect that an increase of our knowledge of septic microphytes may lead to the recognition of the paths that inflammation will follow. Next to the vascular changes and to the infiltrations of lymphoid cells we, at all events, shall have to watch the increase and accumulation of microphytic organisms. The process of traumatic choroiditis shows all the marks of a slow *septic* inflammation; a vascular tissue—made to be well sheltered by a solid, impermeable sclerotic—becomes lacerated, and exposed to the air, and is brought into contact with the decomposable mucus of the conjunctiva. If ever there be an opportunity for septic infection of a wound, here we find all the conditions for it; and it cannot surprise us if septic infection becomes transmitted through the connective lymphatic system.

The results of my considerations may be briefly summarized as follows:—

1.—The hypothesis that sympathetic ophthalmia is explained by reflex action through the ciliary nerves is devoid of all convincing proofs.

2.—Sympathetic ophthalmitis may be looked upon as proceeding from a septic choroiditis of definite type, not improbably resulting from an abnormal continuity between the external tissues and the uvea.

3.—The morbid changes of the vessels, the increase of lymphoid cells, and perhaps also, the accumulation of microphytal organisms, are the guiding signs that may indicate the direction in which the morbid process is propagated.

4.—The path of the transmission is most probably along the lymphatic spaces of the optic nerve.

On the Pathology of Sympathetic Ophthalmitis.

Dr. W. A. Brailey, London.

Can the uveitis which forms so prominent a feature of sympathetic disease be distinguished anatomically from inflammations of the uveal tract produced in other ways?

Clinically two forms of sympathetic inflammation are recognizable in the iris: either there is an iritis, with increased depth of aqueous chamber, and dots on the posterior surface of the cornea, or the iris is thick and velvety, with large tortuous blood-vessels and diminished secretion.

The first condition prevails at the onset of the disease. The iritis appears to be hypersecretive, the synechiæ are neither firm nor extensive; indeed, they may be altogether absent. The general characters, both clinical and pathological, are like those sometimes found in secondary syphilis, being there known as iritis serosa with keratitis punctata, or as aquo-capsulitis. In this communication the general title of uveitis serosa will be applied to this condition, however produced.

The second may, on account of its severity and intractability, well be called a

malignant inflammation, and it will be herein designated by the familiar title, uveitis maligna. This form of inflammation has certain definite anatomical characters by which it can be distinguished from the uveitis of syphilis, myopia, &c. An inflammation with similar characters may be the result of a wound. Indeed, the eye which is exciting the sympathetic inflammation is always the subject of a uveitis maligna. It does not follow, however, that this condition necessarily produces sympathetic inflammation in the fellow-eye. For this purpose it must be of considerable extent and severity. Serous and malignant uveitis are closely related, anatomically as well as clinically. Indeed, it would appear that all traumatic non-suppurative inflammations belong to one type or the other. A traumatic uveitis maligna is, as above said, exactly like sympathetic uveitis maligna. But traumatic uveitis serosa, though in other respects somewhat like the uveitis serosa of sympathetic or syphilitic disease, is not, according to my observation, accompanied by dotted deposits on the cornea. I am informed, however, that these have been observed at Moorfields Hospital, in certain very rare cases of traumatic iritis.

In uveitis maligna, pathologically examined, the thickened iris is closely infiltrated by round lymphoid bodies, capable of being stained deeply by colouring reagents. They make their appearance in clusters, the middle strata being those earliest affected. The clusters increase and coalesce, so that the entire iris is a mass of lymphoid cells. Many of its blood-vessels, especially those near its anterior surface, have very thick and pellucid walls, while their lumen is obliterated by proliferated endothelial cells. A thick stratum of lymphoid cells next makes its appearance on the posterior surface of the iris, behind its pigmented epithelial layer, the pigment of which is scattered and somewhat diminished, so that an irregular zig-zag line is all that represents it. The lymphoid cells are very little prone to changes, whether of degeneration or organization. Those behind the iris become earliest converted into fibrous tissue. There is no change in the cells of the lens capsule, or of Descemet's membrane. The ligamentum pectinatum, and canal of Schlemm, are very little affected.

In the ciliary body the changes are very similar. Clusters of lymphoid cells make their appearance in the midst of the connective tissue on the inner surface of the ciliary muscle, between the latter and the basement membrane of the pigment epithelium. They increase and coalesce till they occupy the entire thickness of this connective tissue layer. Then, similar cells are seen on the internal aspect of the basement membrane, between it and the elongated elements of the pars ciliaris retinæ. The pigment epithelium found normally in this situation disappears as a continuous layer, and its scattered granules form merely an irregular zig-zag line in the midst of the lymphoid cells, as in the iris. The elements of the pars ciliaris retinæ, though they may be widely separated from the basement membrane, are comparatively but little affected till a very late stage, when they may be destroyed by pressure. The fibres of the ciliary muscle are also comparatively little involved.

In the choroid, the clusters of lymphoid cells appear first in the middle layers, the outermost and the chorio-capillaris being, in the earlier stages, perfectly free. The clusters enlarge, encroaching upon the adjacent healthy tissue, and coalescing, finally occupy entirely the much thickened choroid. They do not make their appearance in any special relation to the blood-vessels. They are separated from the arteries by the lymphatic sheath-spaces, though their cells touch the veins more closely. Each cell is about 6μ. in diameter, and has a small clear nucleus. Hitherto I have not been able to detect giant cells among them.

The blood-vessels are gradually invaded and destroyed by the increasing number of cells. There is no proliferation of the pigment epithelium internal to the choroid, and no exudation on either of its surfaces.

There is inflammation in and around the walls of the retinal blood-vessels, especially upon the papilla. Some optic neuritis is present, and also inflammation, which may be considerable or extremely slight, in the intervaginal space of the optic nerve.

In severe cases there are cells on the exterior of the sclera, in the ciliary nerves, and also around them and the long ciliary arteries. The vitreous cells are increased in number, especially in the neighbourhood of the ciliary body and optic disc. In the latter position many are caudate.

In the later stages of the disease the globe shrinks; the firm fibrous tissue developed in the exudation behind the iris and on the ciliary body, contracting, draws away the latter from the sclerotic, and a sparsely-nucleated, tough, not dense fibrous tissue occupies the gap. Similar fibrous tissue is also developed in the choroid, especially in its outer layers. The vitreous lamina bounding the choroid internally becomes wrinkled, and its pigment epithelium disappears. The tough and much-thickened choroid now appears to the naked eye greyish, translucent and avascular.

Uveitis serosa has been made the subject of many inquiries, none better than the recent one of Knies on "Iritis Serosa." Briefly speaking, it consists in an uniform, not dense, infiltration of the thickened iris, choroid, and connective tissue layer of the ciliary body, or parts of them, with lymphoid cells, which can be stained only feebly with reagents. A few similar cells are scattered on the anterior surface of the iris, on Descemet's membrane—where they form little rounded masses—and among the fibres of the zonula. There is also considerable inflammation—more than in uveitis maligna—in and around the walls of the arteries of retina and papilla, extending for some distance along the course of the central vessels of the optic nerve. There is swelling of the papilla, with some inflammation of the optic nerve trunk.

The characters of serous and malignant uveitis, whether of sympathetic origin or not, pass into each other; for in the four cases of well-marked clinical non-sympathetic uveitis serosa which I have had the opportunity of examining, I have found in the uveal tract some of the characteristic cell clusters of uveitis maligna. These are most common in the peripheral parts of the iris, and next in the connective tissue layer of the ciliary body. Here also small globular aggregations of unpigmented cells, in or upon the pigment epithelial layer, are not uncommon, by means of which small tracts of the overlying ciliary retina may be raised in an arch-like manner. And I have seen an area of choroiditis serosa, and a typical patch of choroiditis maligna, existing side by side in one of these eyes, the subject of a well-marked clinical iritis serosa with keratitis punctata, the cause of which, however, remained obscure.

The uveitis serosa in which sympathetic disease usually begins may remain as such throughout the whole course of the disease, or it may take on the characters, both clinical and anatomical, of uveitis maligna.

In this last case, the deposits on the cornea get less, so that they are often unrecognizable by the naked eye, while the posterior synechiæ become very extensive and very firm. The change is usually accelerated by operative interference with the uveal tract.

The clinical characters of uveitis maligna will therefore be usually apparent where the sympathetic disease is of long standing. But I suspect that there always remains in the sympathizing eye some histological evidence that the disease began as uveitis serosa, however well expressed are the clinical characters of uveitis maligna at the time of excision. At least, in the five cases where I have had the opportunity of making such examinations, there were distinct, though slight evidences of dotted deposits on the cornea, though the clinical characters were those of severe uveitis maligna. And I should expect to find similar indications, even where the disease was observed to have had these characters from its very onset. From the above-described conditions, I gather that the two forms of inflammation in sympathetic disease are essentially the same, uveitis serosa being the milder, and uveitis maligna the more severe type. The first appears to be hypersecretive, and the lymphoid cells set free cause pathological changes on Descemet's membrane, in the ligamentum pectinatum, and round the canal of Schlemm. The second is attended with extensive exudations on iris and ciliary body, while the fluid secretion tends to diminish.

The uveitis maligna of the first affected, or causing eye, is usually due to ı ting wound; in rare cases it is caused by a traumatic dislocation of the lens unruptured conjunctiva; in very rare cases it arises spontaneously in eyes in consequence of other long-standing inflammations. I have never seen it ı in an eye previously healthy.

Both forms of sympathetic uveitis differ from those inflammations in whi of lymphoid cells make their first appearance close to the vitreous lamina of tl or close to the pigment epithelial layer of the iris, leading in each case to pr of the pigment epithelium. In this way little heaps of pigment, colloid ı inflammatory exudations, are produced on the internal surface of the vitreous lamina, or tough pigmented membranes on the ciliary body, or ring-like posterior synechiæ. The uveitis of syphilis is of this nature, an cyclitis sometimes following perforated corneal ulcers. The anatomical ch purulent uveitis and of the uveitis of primary glaucoma are also different. I more striking clinical difference is that none of these forms are ever co sympathetic inflammations. My inquiries have not been directed to the and influence of micro-organisms.

Generally speaking, we may say that eyes containing bone, though usuall sympathetic irritation very strongly, very rarely give rise to sympathetic infl of the uveal tract. This may mean only that by the time bone is developed, of active inflammation is passed. But I think that it implies more; for i tions which produce exudations on the internal surface of the choroid—the mos position in which bone is found—are not those which excite sympathetic uveit bone is occasionally found within the choroid, and I cannot say positively th not be developed in this position as a sequel of choroiditis maligna. Hithe been difficult in England to study anatomically the results of uveitis malig former years the practice was to excise the first affected eye directly on the of the sympathetic disease.

Is sympathetic inflammation due to direct physical transmission, or to re action? The similarity of the conditions in the two eyes, and the period required mission, point to the former conclusion. But nerve irritation has some influen disease, though probably only an indirect one; for statistics, taken from the m cords of Moorfields Hospital, comprising fifty-nine cases, show that a wound oc the summer months is more liable than one in winter to be followed by sympathe (twenty-nine wounds in the six summer months being thus followed, as against the other six); and also, that sympathetic inflammation is more likely to bre summer irrespective of the time when the first eye was injured. (There we nine outbreaks in summer as against thirteen in winter. In the remaining ca impossible to fix the date with any precision. The total number of excis approximately equal in the two seasons of the year.) And it happens quite com sympathetic disease appears very shortly after exposure of the second eye to l example, soon after a patient has quitted the hospital. Probably the irritatio stimulates into activity a slight inflammation of the serous type, a conditi might otherwise have escaped notice, or have been passed over as sympathetic i

Though uveitis maligna is accompanied by some optic neuritis, yet it is note that the nerve is more inflamed in many diseases which are not known to fellow-eye sympathetically—*e.g.*, glaucoma and uveitis serosa.

The physical condition of the ciliary nerves and blood-vessels will not a necessary explanation, nor will that of the sclerotic or episcleral tissue. It is probable that the inflammation may travel along the loose tissue between dural optic nerve-sheaths; but it is to be remembered that the inflammation of this i extremely slight, compared with that of the uveal tract itself, and that syn inflammation may occur without any implication of the choroid in the neigh of the papilla of either eye.

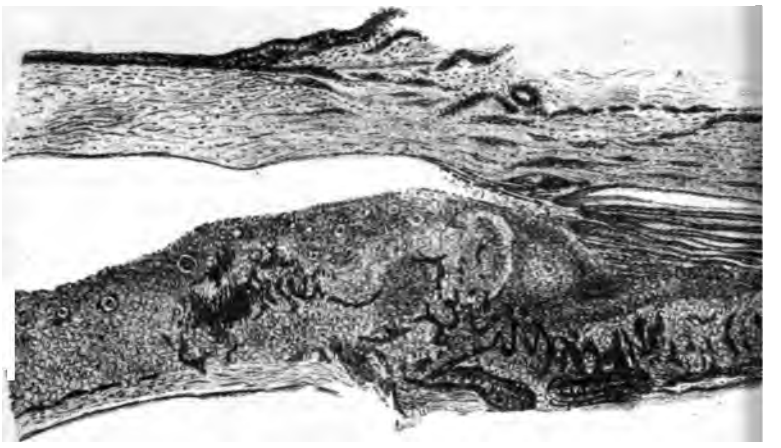

Fig. 1.

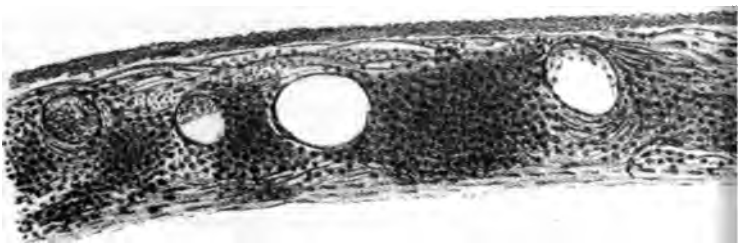

Fig. 2.

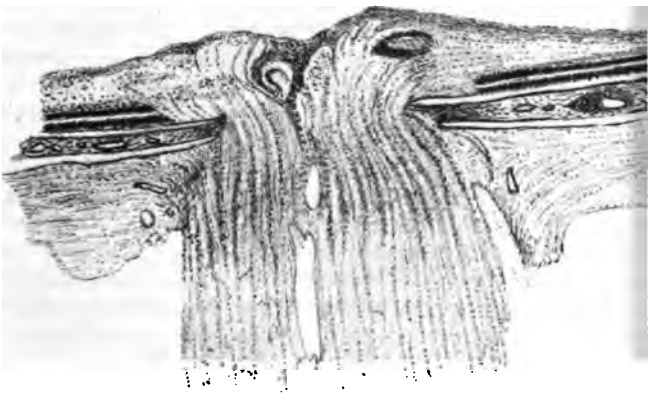

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Fig. 3.

Occasional cases point towards the existence of sympathetic inflammatory affections of cornea and optic nerve, independent of any sympathetic uveitis; but at present the evidence does not appear conclusive.

The well-known sympathetic irritation which causes pain, photophobia, sluggish iris, feeble accommodation, injection of conjunctiva, and, indeed, all the morbid conditions consequent on impaired nutrition, inclusive probably of corneal ulcer, and, after long duration, even of cataract, is entirely different from true sympathetic inflammation. Shrunken eyes, and especially those containing bone, are its most prominent causes, though such are rarely productive of sympathetic uveitis. Though mostly relieved by excision of the first-affected eye, sympathetic irritation may be kept up by an irritable condition of the socket. It usually bears a direct relation to the amount of pain in the first eye, and is doubtless due to a reflex irritation of the ciliary nerves.

If I might venture to draw from pathology an inference as to treatment, it would be that, as long as sympathetic irritation is absent, enucleation of the first-affected eye is only justifiable where it is absolutely sightless, or where it is painful.

The case is different where sympathetic irritation is superadded to a sympathetic uveitis; for, in my opinion, the former, though incapable of producing, yet can aggravate the latter. Here, as in the cases where sympathetic irritation alone is present, we must be guided in the question of enucleation by the degree of this, and by the condition of the inflamed eye.

I should judge, lastly, from a consideration of the statistics I have quoted, that the exclusion of light is an important factor in the treatment of sympathetic disease, and that cataract operations are less likely to be followed by this dire calamity in the duller season of the year.

Description of Plate.

Fig. 1.—Meridional section through ciliary body and iris.—The iris is much thickened by an infiltration of lymphoid cells. A stratum of similar cells behind the scattered remains of its pigment epithelium layer unites it firmly with the lens-capsule. Near its anterior surface numerous blood-vessels are seen. Each has thickened pellucid walls and lumen obliterated by endothelial proliferation. The part of the ciliary body internal to the fibres of the ciliary muscle is in a similar condition, except that the peculiar blood-vessels are not seen.

Fig. 2.—Section through choroid—Clusters of similar lymphoid cells are seen in its middle strata. The chorio-capillaris is free from them.

Fig. 3.—Section through optic disc in horizontal plane.—The papilla is somewhat swollen, and there is an increase of nuclei round its blood-vessels. There is slight neuritis, as well as some nuclear increase in the space between the dural and pial nerve-sheaths; a characteristic cluster of lymphoid bodies is seen in the middle stratum of the choroid.

Comment l'Ophtalmie sympathique peut-elle se produire après l'Enervation?

Médecin Principal Dr. Poncet de Cluny.

Si l'anatomie pathologique n'a pu formuler d'une façon certaine quelle était la voie suivie par l'irritation se portant d'un œil sur un autre dans les conditions ordinaires, il paraîtrait plus difficile encore de savoir comment se développent les accidents sympathiques quand le chirurgien a sectionné les nerfs qui mettent en rapport les deux organes.

L'ophtalmie sympathique se produisant après l'énervation n'est malheureuse-

ment pas un fait rare, et nous en possédons aujourd'hui un assez grand nombre d'exemples : mais les commentaires qui expliquent ces irradiations douloureuses varient avec les auteurs.

Pflüger, portant surtout son attention sur les conséquences de l'hémorrhagie, estime que le caillot rétro-bulbaire s'organisant, est capable d'exercer une influence funeste sur les voies de communication de l'œil sain. Derby a soutenu aussi cette opinion devant la société médicale de Boston. Wadsworth énucléant un œil énervé insensible, mais restant la cause de douleurs profondes dans l'orbite, accepte l'hypothèse d'une affection rhumatismale.

Un fait de ce genre s'étant produit cette année à la clinique de notre collaborateur et ami M. le Dr. Landolt, il nous a semblé utile de faire un examen approfondi de l'œil énervé, puis énucléé, qu'il a bien voulu nous remettre.

Voici les renseignements cliniques qui nous ont été fournis à ce sujet :

M. Jacq, âgé de 67 ans, a perdu complètement la vision de l'œil gauche, d'une façon brusque, et, d'après les renseignements fournis, par un décollement de la rétine, il y a près de 20 ans. Il est atteint à l'œil droit d'une myopie=20 D. Acuité=$\frac{5}{100}$.

En Avril, 1880, des douleurs atroces se déclarent dans l'œil gauche. Iris décolorée, augmentation de la tension. De plus, à droite la vue diminue et des troubles du corps vitré se produisent.

Le malade refuse l'énucléation qui lui est proposée, et demande l'énervation dont il a entendu parler.

Le 20 Avril, 1880, cette dernière opération est pratiquée par M. le Dr. Landolt, qui résèque une portion du nerf optique, et sectionne largement les tissus autour du pôle. Hémorrhagie. Peu de réaction. L'œil énervé est immédiatement insensible ; toutefois la sensibilité de la cornée reparaît quatre jours après, et en même temps l'acuité visuelle diminue rapidement à droite ; des douleurs se produisent dans cet œil.

En Mars, 1881, la cornée gauche est tout-à-fait insensible ; l'œil droit est le siège de douleurs profondes, la conjonctive est injectée, chémosis général ; l'acuité baisse rapidement.

L'énucléation fut proposée à nouveau et pratiquée le 2 Mars ; l'opération fut suivie de la cessation des douleurs à droite, et l'acuité remonta d'une façon notable ; à la fin d'Avril le malade pouvait se conduire, tandis que deux mois avant il ne distinguait pas les doigts à deux mètres.

L'œil extrait, plongé pendant un mois dans une solution d'acide chromique légère, était, au moment où l'examen fut pratiqué, d'une consistance dure, donnant à la pression cette résistance générale particulière aux bulbes dont les humeurs mélangées d'exsudat, se coagulent sous l'influence de la solution chromique. C'est un moignon phtisique, quadrangulaire, avec dépressions équatoriales ; il mesure 23 millimètres transversalement, 19 verticalement, et 18 d'avant en arrière.

La cornée est rétrécie en tout sens, mais surtout verticalement ; elle est ovalaire et recouverte en quelques points par un exsudat blanchâtre.

Au pôle postérieur, nou recherchons en vain des traces du nerf optique. Il a été abrasé dans la première énervation, et même réséqué sur une petite longueur. Toute cette région pôlaire est englobée dans un tissu cicatriciel induré, formant une upule épaisse.

Une section verticale équatoriale pratiquée au niveau de la partie postérieure du stallin, nous a montré que toutes les humeurs de l'œil étaient, comme nous ions pensé, coagulées, l'œil se coupant comme un morceau de gélatine.

La disposition des parties était la suivante : En dedans de la sclérotique, à 2 ou 3 millimètres, existe un filet noirâtre circulaire ; c'est la choroïde épaissie, et dont il est déjà permis de noter la purulence ; en dedans de cette membrane, un cercle d'exsudat irrégulier, de 3 ou 4 millimètres, la sépare d'une masse plissée au centre, c'est-à-dire de la rétine. Enfin, au milieu de l'organe, se voit la cupule du cristallin dont la face postérieure est enclavée dans un exsudat qui réunit la lentille au convolvulus rétinien.

Cette simple coupe macroscopique démontre donc déjà un décollement complet de la rétine, avec suppuration de la choroïde et altération profonde des humeurs.

L'examen histologique a été pratiqué sur les deux segments antérieur et postérieur; et nous en résumerons les données aussi brièvement que possible en n'insistant que sur les points spéciaux à cet œil.

Segment antérieur.—Les coupes micrographiques comprennent la cornée, l'iris, et une partie du cristallin. Elles ont été faites suivant les procédés ordinaires gomme et alcool, et la section pratiquée du cristallin à la cornée, c'est-à-dire, d'arrière en avant ; ce détail a quelque intérêt.

Toutes les parties constituantes de ce segment sont coulées pour ainsi dire dans une gangue de fibrine ; exsudat coagulé qui permet d'avoir des préparations d'une exactitude topographique précieuse.

Notons que la face antérieure de la cornée à son limbe, présente une chemose fibrineuse, hémorrhagique, qu'il estassez rare d'avoir à examiner. La membrane de Bowman à son extrémité, est séparée de l'épithelium. On reconnaît son filet anhiste isolé du revêtement cellulaire par une cavité hémorrhagique et un épanchement fibrineux mêlé de leucocytes. Cet exsudat s'est produit à la limite du tissu lymphatique conjonctival. Les faits les plus graves se rapportent à l'état de la chambre antérieure, soit au centre, soit vers la région ciliaire.

Centre.—La solution de picro-carminate permet de constater ici des détails de majeure importance. La cornée elle-même n'est pas en voie de suppuration ; ses faisceaux sont épaissis, disjoints, le protoplasma des cellules fixes est hypertrophié, et il existe çà et là quelques vaisseaux de nouvelle formation ; toute cette partie est colorée en rose par le carmin. En arrière de ce tissu cornéen se trouve une bandelette d'exsudat, d'une structure absolument différente de la cornée, mélange de leucocytes et de fines fibrilles d'une couleur jaunâtre séparant la cornée de la membrane de Descemet. Celle-ci, vivement colorée par le carmin, forme un filet replié, sinueux, adhérent en quelques points à cet exsudat rétro-cornéen, mais le plus souvent à un exsudat placé en avant de l'iris. Les replis de cette membrane de Descemet sont comblés par un mélange de globules sanguins et de fibrine.

L'iris, transformée en un tissu complètement purulent, embyronnaire, ne contenant plus de vaisseaux normaux, est enclavée dans deux couches d'exsudat fibrineux, l'une antérieure soude ce voile aux replis de la membrane de Descemet : l'autre postérieure la réunit non moins solidement à la capsule antérieure du cristallin. Cette disposition existe sur toute la surface postérieure de l'iris ; les synéchies étaient complètes et l'espace postérieur n'existait plus.

Le cristallin était complètement graisseux. Nous avons retrouvé la cristalloïde antérieure sans épithélium ; cette couche cellulaire était remplacée par un exsudat fibrineux, avec globules blancs en voie d'organisation.

Région ciliaire.—Les désordres sont encore plus grands. A la périphérie de la cornée, le canal de Schlemm et les vaisseaux voisins sont remplis de pus et de pigment. Le ligament pectiné n'est qu'un reticulum purulent se rendant à la

région ciliaire et à l'iris, dont toutes les parties sont aussi gorgées de globules blancs, au point que l'organisation primitive a disparu. Dans le sinus terminal de la chambre antérieure, sur un grand nombre de préparations, nous avons pu suivre la mode du rupture de la membrane de Descemet: de petits fragments restent adhérents près du ligament pectiné, tandis que la membrane entière est en synéchie antérieure avec des exsudats de l'iris.

Les faisceaux du muscle ciliaire sont eux-mêmes dissociés par le pus.

Enfin—fait sur lequel nous avons insisté déjà en 1874, dans nos premières recherches sur les décollements de la rétine—entre la sclérotique et le muscle ciliaire existe un exsudat séreux purulent très-abondant qui n'est séparé de la chambre antérieure que par la zone pectinée.

Qu'il nous soit permis de dire incidemment, qu'il faudrait, dans des conditions semblables pratiquer une communication entre la chambre antérieure et la région postérieure, en détachant cette barrière pectinée. Il suffit de jeter un coup d'œil sur la figure représentant la disposition de ces parties pour comprendre qu'une section de la cornée et le détachement de la zone pectinée constituaient un véritable débridement des régions postérieures de l'œil.

Segment postérieur.—Nous ne voulons nous arrêter qu'aux faits principaux, et il nous suffira de dire que toute la choroïde depuis la zone ciliaire jusqu'au point d'entrée du nerf optique n'était qu'une nappe purulente. Dans les points les moins altérés, la purulence était remplacée par un mélange de leucocytes et de sang.

La rétine adhérente par la zone ciliaire formait un entonnoir plissé. Ce tissu n'offrait plus trace de l'organisation première; tous les éléments propres avaient disparu, et il ne restait que des mailles allongées formées par la substance de soutien (fulchrum, mélangé de pus). Cette disposition est bien connue en anatomie pathologique.

Mais ce que nous n'avions jamais rencontré sur aucun bulbe phthisique, c'est la séparation du pédicule de la rétine à l'entrée du nerf optique. Nous avons dit que tout ce segment postérieur était englobé, coulé pour ainsi dire, dans un exsudat gélatineux; les parties avaient en outre été gommées et traitées par l'alcool; elles étaient donc bien en place. Or, sur toutes les coupes, le pédicule terminal de la rétine, qui devait s'appuyer sur la lame criblée, était reporté latéralement à 3 ou 4 millimètres et soudé à la choroïde par un tissu fibreux nouveau. Cette disposition était d'autant plus aisée à vérifier, que le tissu rétinien, même dégénéré, reste coloré en jaune au picro-carminate, tandis que le tissu conjonctif même est vivement rosé. La différence des couches est facile à constater.

Ce tissu conjonctif nouveau partait de l'orifice du nerf optique, pénétrait dans le globe et se terminait dans l'exsudat situé entre la choroïde et la rétine déplacée. Quant à trouver un vestige du nerf optique continuant la rétine, il n'en existait pas, et tout le canal ancien était comblé par un tissu fibreux occupant la gaîne même du nerf. Nous avons constaté que les faisceaux connectifs de la gaîne vaginale, à revêtement endothélial si caracteristique, limitaient précisément ce tractus fibreux. Il se confondait en arrière de la sclérotique avec un magma cicatriciel formant cupule au globe énucléé.

Le tissu cicatriciel formé au lieu de la première section optico-ciliare, était très-dense et composé de gros faisceaux solidement unis à la sclérotique. C'est au milieu de ce tissu et immédiatement adjacentes à la sclérotique que nous avons rencontré presque toutes les extrémités centrales des nerfs ciliaires sectionnés, éparses dans cette cicatrice aux environs de l'ancienne ouverture optique. Sur des coupes

où la section avait été perpendiculaire, il nous a été facile de reconnaître que ces filets ciliaires étaient le siège d'une grave altération. Comprimés dans la gangue cicatricielle, ils ne contenaient plus que de rares tubes intacts, c'est-à-dire à myéline et à cylindre axe. Un grand nombre de ces filets avaient complètement disparu : les uns étaient réduits à l'état de fibres de Remack, d'autres ne contenaient pas de cylindres axes et se présentaient à la coupe comme une goutelette graisseuse. La plus grande surface de la section était occupée par du tissu conjonctif fasciculé, émanant de la gaîne générale du tronc nerveux.

La lésion très-évidente de ces nerfs ciliaires était donc une sclérose avec dégénérescence atrophique des tubes nerveux.

Sur des coupes longitudinales, outre la sclérose, également très-nette, nous avons constaté une vascularisation anormale de ces nerfs ciliaires, et, en certains points, de véritables hémorrhagies.

Dans cette même région cicatricielle existaient aussi des vaisseaux ciliaires en pleine voie de suppuration (phlébite et artérite), traversant la sclérotique pour s'aboucher dans la choroïde. La suppuration, en un mot, pouvait être suivie depuis le lieu de la section optico-ciliaire jusque dans les membranes et les milieux oculaires.

Enfin en séparant la choroïde purulente, nous avons retrouvé contre la sclérotique des débris des nerfs ciliaires intra-bulbaires. Ces filets sectionnés depuis un an étaient frappés d'une dégénérescence absolue ; en les dissociant avec le plus grand soin, après teinture au picro-carminate, il ne nous a pas été possible de retrouver un seul tube ressemblant de loin à une fibre normale : plus de myéline, quelques fibres mélangées à du tissu conjonctif et difficiles à distinguer de ce dernier, reliquats de cylindres d'axes entourés de leucocytes ; voilà ce qu'il en restait.

Loin de rencontrer ici, comme dans certaines expériences sur les animaux, une régénération des nerfs ciliares, c'est la dégénérescence absolue que nous avons constatée. Au plexus ciliaire, vers les procès, la suppuration était encore plus accentuée.

Les *conclusions* à tirer de ces recherches histologiques relativement à la propagation de l'ophtalmie sympathique nous paraissent graves.

Il est certain en effet que l'énervation n'a pas arrêté la marche des accidents. Cette opération pratiquée un mois après l'invasion des premières douleurs n'a pas été suivie d'apaisement, malgré les soins pris pour arrêter tout courant nerveux. Il faut même reconnaître que les délabrements constatés sur cet œil énervé dépassent ceux qu'on rencontre d'habitude dans les bulbes en voie d'atrophie. Le décollement de la membrane de Descemet, la suppuration généralisée de tout le tractus irido-choroïdien, les hémorrhagies, la séparation totale de la rétine d'avec son pédicule optique sont des faits rares, indiquant une intensité inflammatoire, une abondance d'exsudat purulent peu ordinaire. L'origine de cette suppuration est clairement indiquée par la purulence des vaisseaux ciliaires ; le mal est parti du lieu primitif de la section optico-ciliaire. Cette opération a été un coup de fouet donné à la suppuration du bulbe.

Nous avons donc dans ce cas une confirmation malheureusement trop précise des dangers de cette méthode, dangers que nous avons déjà signalés par des recherches expérimentales.*

Dans plusieurs cas d'énervation la sensibilité s'est rétablie, a persisté et amené des irradiations sympathiques, puis finalement l'énucléation. La physiologie a

* *Archives d'Ophtalmologie*, No. 2, 1881.

démontré en effet que les branches nerveuses de la cinquième paire aisément se régénérer et rétablir le courant nerveux au bout de quelques voie que pourrait suivre dans ces conditions l'ophtalmie sympathique serai la même. Mais ici tel n'est pas le fait. Notre confrère M. Landolt, co bien la possibilité de retour de la sensibilité, avait pris soin de rés portion des tissus nerveux; de plus, nous avons constaté la dégénérescen des filets ciliaires intra-bulbaires.

Ce n'est donc point par suite des accidents de ce phtisie oculaire, trè il est vrai, que les phénomènes sympathiques (douleurs, diminution d troubles du corps vitré) ont pu continuer leur marche ascendante et forc de chercher une autre cause en dehors des parties contenues dans la sclé

Des faits semblables, nous ne l'ignorons pas, se produisent après l'éni et les recherches de Lawson, pour ne citer que les plus récentes, démont que l'ophtalmie sympathique peut continuer après une énucléation pratiq de bonne heure. Notons cependant que les faits contraires à la thèse d sont fréquents, et le malade même dont nous rapportons l'observation état s'améliorer notablement, les accidents céder de suite et par l'extractio malade; il est dès lors permis de penser, d'après ce résultat, que si l'ér avait été pratiquée de suite, l'œil congénère eût été exempté des phéno ont suivi l'énervation. Mais, quoiqu'il en soit, et en acceptant encore t remarques judicieuses et cliniques de Lawson, la question n'en reste p posée: Quelle est l'origine de l'irritation sympathique après l'énervation? veut transporter plus loin la question, pourquoi l'énucleation n'arrête toujours ces accidents?

Nous pensons que dans notre observation l'état de la cicatrice au pôle p la sclérose irritative des nerfs ciliaires fortement injectés, comprimés dans connectif, la suppuration même des vaisseaux de la région, sont d suffisants pour admettre une névrite localisée sur les extrémités du bou des nerfs. Il ne nous a pas été donné jusqu'ici d'examiner l'état d'un du nerf optique, mais le travail cicatriciel qui s'y produit est analogue à filets ciliaires, il agit même sur des éléments nerveux plus délicats, plus se

Nous croyons en un mot qu'il peut se former, après la section opti un magma cicatriciel, avec névrite des filets sectionnés, comme les névro une amputation de la jambe: d'où permanence des douleurs sympathique

Ces conditions se réalisent-elles dans l'énucléation? C'est aux exame logiques à le démontrer, et peut être les échecs de l'énucléation, mis en par Lawson, trouveront-ils là une explication anatomique.

Mais il faut bien reconnaître que les conditions ne sont pas les mê l'extirpation pure et dans l'énervation. Dans le premier cas la cicatrice simplement sur la muqueuse, derrière laquelle, dans une énucléation bien capsule de Tenon n'a pas subi de désordre important; l'hémorrhagie est ex il n'existe pas d'induration du moignon. Avec l'énervation, au contrair celle-ci s'accompagne d'une large dénudation du pôle, de la résection optique, la capsule est fatalement ouverte. Le malade de M. Landolt eu de fièvre, mais l'hémorrhagie a été abondante derrière le globe; cicatriciel que nous avons trouvé au pôle était épais, induré, p jusque dans les milieux oculaires; la suppuration des vaisseaux de l était manifeste et s'étendait à la choroïde. La section optico-ciliai créé un foyer d'irritation dont le premier effet a été *la névrite ciliaire per* et la propagation de l'ophtalmie sympathique.

DISCUSSION.

Dr. MOOREN, Düsseldorf: I believe that the extension of sympathetic inflammation takes place through the optic and ciliary nerves. Clinical observations are more in favour of the optic nerve. This has been found pathologically by Brailey, Hirschberg, and Alt. Extension of every neuritis depends on a reflex dilatation of the vessels. The influence of the vascular system explains the rapid development of sympathetic disturbances in the other hitherto intact eye. Cohn's observations explain the complete absence of painful sensations in the ciliary body, for the area of the inflammation may have been localized in some more distant part of the ciliary nerves. After enucleation, we can often see the phenomena of neuritis in the naso-ciliary and optic nerves. In every inflammation the lymph acts as a decomposing influence on the axis cylinder and leads to its swelling. In this sense the lymph favours the development of inflammation. But the latter is only produced as the effect of reflex dilatation of the vessels; for cauterizations of the cornea with nitrate of silver show immediately afterwards an excess of fibrine and albumen, not only in the anterior chamber of the affected eye, but likewise of the other.

Professor GRUENHAGEN, Königsberg: I am strongly of opinion that, in the question as to how sympathetic ophthalmitis is set up, the nerves which dilate the vessels of the eye deserve more consideration than has hitherto been their share. In experiments on curarized animals (rabbits, cats) it results that irritation of the cornea of the one eye causes the secretion of albuminous and fibrinous material, together with a migration of white blood-cells, not only into the aqueous of the irritated, but also into that of the unirritated eye. The explanation of this fact I believe to be that irritation of the sentient corneal nerves leads reflectively to an excitement of the nerves which dilate the blood-vessels, and that in consequence of the relaxation of the vascular walls an increased separation of albumen and fibrine results.

Professor PFLÜGER, Berne: About two years ago I observed a case analogous to that of Poncet. It was published in the reports of the Ophthalmic Hospital of Berne, in 1878. The eye was quite painless after the neurotomia optico-ciliaris, but the patient complained of a feeling of pressure behind the eye, and said he felt as if a wall were there. At enucleation, on account of sympathetic irritation, a mass consisting of new-formed connective tissue was found behind the eye, pressing on the peripheral ends of the ciliary nerves. Although I myself have experienced no such evil results, yet it is always possible that they may occur, and the risk of this is, in my opinion, a very great drawback to the operation. Though, indeed, the same thing may occur after enucleation, yet, this is extremely rare in proportion to the great number of enucleations performed.

Dr. SAMELSOHN, Cologne: There is another way of propagation of the inflammation producing sympathetic disease, as I can prove by an anatomical specimen —viz., the way through the suprachoroid and the sclera, along the sheaths of the vessels and the ciliary nerves into the supra-vaginal space, itself a lymph-space in connection with the lymphatic spaces of the brain.

Professor LEBER, Göttingen: I have lately made a great number of experiments on rabbits. I irritated one eye in various ways. The cornea, iris, or ciliary body was exposed

to chemical or mechanical irritation; or foreign bodies of the most various nature were introduced into the anterior chamber. I have never observed the least hyperæmia in the fellow eye. My observation was especially directed to this point, for it was of the greatest interest to me to observe the mode of origin of sympathetic inflammation. I cannot at all explain the observations that Professor Gruenhagen has communicated, but I think that they have no value in relation to the origin of sympathetic disease. I think that his hyperæmia of the vessels in the second eye must have been inferred only, for I could scarcely have passed it over in my long-continued observations.

Dr. Boucheron, Paris, in connection with Dr. Poncet's case, thought that it was not altogether unfavourable to the operation of enervation. Indeed, the very changes resulting from that operation would probably so alter the condition of things that sympathetic disease could not now reproduce itself. Poncet had found the ciliary nerves as far as the scar completely degenerated, and hence they could not transmit sympathetic ophthalmitis even if the conditions favourable to it had existed in the first eye. The persistence of corneal sensibility was not, in the speaker's opinion, as it had been considered, a powerful argument against enervation. He interpreted it by the existence of recurrent filaments supplying the cornea from the supra- and infra-orbital nerves, which escaped division, however completely the posterior part of the eye had been denuded. He compared this sensibility with the recurrent sensibility of the hand observed by Arloing and Tripier after division of the median, and in the eyelids after division of the supra- and infra-orbital nerves. The recurrent nerves of the cornea, not supplying any other part of the eye, could not, in the speaker's opinion, transmit sympathetic disease. He accounted for the occurrence of sympathetic disease in Poncet's case by the presence of neuritis in the ciliary nerves outside the eye. He thought enervation the proper remedy for painful stumps.

Professor Panas, Paris, called attention to the dangers of enervation, and mentioned one case in which the eye was lost, and another of death from basilar suppurative meningitis in a child of fourteen years, coming on on the third day after the operation. He insisted on the importance of complete antiseptic precautions, with iced carbolized compresses. He considered enervation a more formidable operation than enucleation, which he had never known followed by dangerous results, even in cases of suppurative panophthalmitis.

In the course of the discussion, Dr. H. Snellen asked Dr. Gruenhagen what animals were used for his experiments, for he himself had been trying in vain to get sympathetic ophthalmitis in animals, notwithstanding that he had used different sorts of animals, and inflicted different kinds of injury.

Dr. Leber, Göttingen, stated that he always got the same negative results.

Dr. Horner, Zürich, asked Dr. Gruenhagen whether he had taken the aqueous humour during life or after the death of the animal.

Dr. Gruenhagen, Königsberg, answered that he had used rabbits, and that he had taken the aqueous humour after killing the rabbit, by means of a fine puncture through the cornea.

Dr. SNELLEN, replying to the discussion, said that all speakers seemed to agree that sympathetic irritation is to be distinguished from sympathetic inflammation. Sympathetic irritation may be the result of reflective nervous action. The hypothesis of sympathetic inflammation by reflective action from the ciliary nerves has met here with no defender. Only Dr. Gruenhagen has communicated that he got increase of fibrine and of cells in the anterior chamber in both eyes after wounding one eye, which he ascribes to the action of vaso-dilator nerves. As Gruenhagen took the aqueous humour after death, he may be reminded that Deutschmann has lately stated that after death the aqueous humour can be restored, and then always shows an increase of fibrine. The highly-interesting researches of Dr. Brailey show that the inflammation of the uvea is of a typical character. Besides, in almost every case of sympathetic ophthalmitis more or less neuritis has been found in both eyes. Much evidence has been brought forward, proving that the inflammation may be traced along the optic nerve. However, this inflammation does not seem continuous and equal over the whole nerve. The different observations put on record seem to prove that not a continuous but more a metastatic inflammation may be accepted. As the neuritis is in some cases slight, it is probable that the transmission goes through lymphatic spaces. Whether the extra-dural (as Dr. Samelsohn suggests), or the sub-dural or the sub-pial lymphatics here predominate, or whether all together may have a share in the transmission, will have to be determined by future researches.

Considérations pratiques sur l'Examen des Employés du Chemin de Fer et de la Marine au sujet du Daltonisme et de la Vision.

Dr. LIBBRECHT, Gand.

Le Daltonisme.—Pour l'observateur superficiel, l'examen de première main à l'aide des laines colorées semble élémentaire. C'est là, sans contredit, une erreur flagrante. Le savant Professeur Holmgren propose, dans son ouvrage, de faire subir un double examen aux ouvriers des chemins de fer. Le premier serait provisoire, et pourrait être pratiqué par tous les médecins des administrations; le second servirait de contrôle, et rentrerait dans les attributions d'un ophthalmologiste.

Sans doute notre éminent confrère est d'une compétence que nul ne contestera. Permettez-moi cependant de dire qu'il me paraît nécessaire que le premier examen, comme le second, soit exercé par un spécialiste.

Plus d'une raison milite en faveur de cette opinion. Qu'il me suffise de vous faire remarquer, que dans mes recherches, j'ai rencontré un nombre relativement considérable de sujets atteints de Daltonisme ou ne possédant pas l'acuité visuelle normale; et cependant, entrés récemment dans l'administration, ils avaient subi, avant leur admission, devant le médecin agréé, l'examen rigoureux que prescrivent les réglements.

Nos confrères—ai-je besoin de le dire ?—s'acquittent de leurs fonctions avec zèle et dévouement, et les erreurs qu'ils commettent ne sauraient être imputées qu'à leur inexpérience.

Acuité visuelle.—Sur les 8,000 sujets soumis à mon examen, il s'en est trouvé 7·18 sur cent.* qui ne possédaient pas l'acuité visuelle normale; alors que les

* Impossible de le dire exactement, attendu que je n'ai trouvé la défectuosité des échelles qu'après avoir fait la statistique.

Daltoniens ne se rencontraient qu'au nombre de 2·60 sur cent. Q défectuosité du champ visuel, elle n'est guère fréquente (½ sur cent.), et ment elle n'affecte qu'un œil.

J'ai examiné 300 femmes, et deux seulement d'entr'elles étaient vici vert : aucune ne l'était pour le rouge. Les différentes théories que l'o pour expliquer la rareté du Daltonisme chez le sexe ne me paraisse cluantes.

J'ai peine à admettre que chez la femme se livrant aux travaux des des travaux que ne réclament aucun effort d'intelligence, le sens chro développe outre mesure.

Et si la faculté de distinguer les couleurs se perfectionne chez l' l'éducation, je vois surgir de nouveau la difficulté lorsque j'examine le car, comme je l'ai constaté, sur 2,215 enfants, le Daltonisme se rencontr chez les petites filles.

Le Professeur Horner a produit des travaux remarquables à ce s néanmoins la question me semble rester ouverte.

Le Daltonisme est peu fréquent chez les personnes du sexe ; c'est inc Mais, dans l'état actuel de la science, il serait téméraire, je crois, d'ass cause exacte à cette immunité.

Parmi les sujets que j'ai examinés s'en rencontraient un grand nombr toute instruction.

Cette circonstance m'a permis de constater que le Daltonisme aff tinctement et dans les mêmes proportions les personnes lettrées et les mais sous le rapport de l'acuité visuelle, ces derniers soumises à l'ex échelles atteignent en si grand nombre la vision normale, alors qu'i pas ainsi pour les premières. Il semblerait donc que les ouvriers ill sentent sur les lettrés une véritable supériorité.

Or cette supériorité n'est pas réelle.

Elle n'est qu'apparente, et la cause de la différence résulte de ce que sont plus difficilement reconnues que les signes.

Et en effet des employés, c'est-à-dire des personnes sachant lire, n' que deux tiers sur l'échelle des lettrés, et arrivent au contraire à la visio sur l'échelle des illettrés.*

Dans nos divers congrès nous avons été unanimes à décider qu'il d'instituer une commission internationale à l'effet d'établir un mode d'examen au point de vue du Daltonisme.

Nous avons décidé aussi que, pour rendre cette mesure féconde en il est indispensable que les gouvernements et les administrations adm préalable les mêmes signaux affectant des couleurs identiques.

Les circonstances sont du reste favorables à leur réalisation : nous vons en effet au sein de ce peuple britannique qui jamais ne reste indif idées de progrès, et peut-être le gouvernement de Sa Majesté daignera-t- l'initiative d'une réunion internationale.

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* Donc un tiers de différence pour toutes ces statistiques.

A New Method of Examining and Numerically Expressing the Colour Perception.

Dr. Ole Bull, Christiania.

The method is based on producing the four principal colours of an equal shade and intensity.

As there are different opinions about which hues of the four principal colours ought to be considered as the purest, it is necessary to make a choice between them. I have tried to find out which are the purest, in a physiological sense, in the following manner:

For the blue I have chosen that hue which, mixed up with any amount of uncoloured light, has appeared either as blue or colourless. The complementary yellow is then produced of such an intensity as to give, when mixed on the rotating disc with blue in equal parts, an uncoloured (grey) light.

In selecting the red and green I had to seek some other method. As the colouring of the yellow-spot in different individuals is not the same, either in intensity or in hue, the perception of these colours is modified in accordance therewith. Therefore the purity of these colours can better be controlled by examining them with the peripheral parts of the retina. It is a well-known fact that hues of red and green, which on the central part of the retina are estimated as the purest, if presented sufficiently far out on the periphery, appear as yellow, and that the complementary colours, blue-green and rose, appear as blue. But there must exist hues of red and green which, with all parts of the retina, are perceived in their real colours, if perceived as coloured at all. Such hues of these colours, which I would call physiological red and green, are not difficult to produce. Mixed with each other in equal parts they, too, like the blue and yellow, will, if they be of the same intensity, give an indifferent grey.

Having produced the four principal colours in such a way that each pair of the complemental colours, when mixed in equal parts on the rotating disc, gives a colourless grey of the same shade, I can be sure that the intensity of each colour in the two pairs is alike. This, however, gives no assurance that the red may not be more intense than the blue, or the green more intense than the yellow. In order to examine the intensity of the non-complementary colours I have determined the magnitude of the sector sufficient to give on the rotating disc an impression of each colour. By altering the intensity up to a point where the same average magnitude of the sector (deduced from a number of observations) gives a perceptible impression of the colour, I have succeeded in producing four colours of like intensity.

From each of these four colours, of the same intensity and shade, a series of six different tints is made, by mixing up on the disc of Maxwell the single colour with uncoloured (grey) light of the same shade as that given by each pair of the complemental colours mixed together. These six tints of each colour I have fixed by imitating them with pigment. To try the correctness of the imitation I have painted the pigment on small round plates, which, on the disc of Maxwell, can be put over the coloured and grey plate. In this manner it is not difficult to compare the tint given by the pigment and that given by the coloured and grey sector mixed together. When a correct harmony is obtained, so that, for instance, a tint of yellow, corresponding to yellow 160° and grey 200° on the rotating disc, is produced by pigment (this was shown by experiment), then the relative intensity

of the colour given by the pigments can be expressed simply by indicating the degrees of the coloured sectors—viz., 40°, 60°, 80°, 120°, 160°, 240°. With the same pigments, I have painted on a black plate squares 1 cm. in length, and the same distance apart. These squares I have arranged in such a manner, that one or more coloured squares of the same intensity, but of different hues, are put together in one line with one or more grey squares. On the cardboard, we consequently have seven different tints of each colour—namely, the unmixed colour and six fainter tints derived from it.

Now, if we want to make an examination of a patient's colour-sense, this may be done by simply pointing out any coloured or uncoloured square, and then asking the patient to indicate that square which to him appears most like it. If he is colour-blind, he will make mistakes, and sometimes point out as alike complemental coloured squares. If his colour-sense is diminished by disease of the nervous apparatus, not only the kind of his commencing colour-blindness may be detected, but also the grade. I have found from examining a great number of individuals, that a healthy eye at a distance of one metre from the plate can just discern the faintest tint (corresponding to 40° of the coloured sector and 320° of grey). Therefore, when I find that a patient can do this, I say his colour-sense is normal. But if, for instance, he can discern green only up to 120°, red to 80°, blue and yellow to 40°, I judge that he is beginning to turn red-green blind, and his perception of these colours may be expressed for the green by $\frac{40}{120}$ and for the red by $\frac{40}{80}$. If he is suffering from any disease by which his perception of light is lowered, he will be in the same plight as the normal eye by diminished illumination, and consequently confuse faint tints of yellow with red and green with blue. The plate may therefore serve not only to detect and numerically express aberrations in the colour-sense, but also as a means of diagnosis between diseases of the nervous apparatus and those of the external layers of retina.

In order to examine the peripheral colour-perception, I have painted upon a small round disc the four principal colours in squares measuring 2 cm. By putting the discs under a second black plate with a central pin, around which they can be turned, any of the four colours may be brought before a quadrangular opening in this plate, and so be singled out to view.

Owing to the yellow pigment in the central part of our retina, our perception of blue and yellow cannot be in this region so sharp as for the red and green. If we therefore examine the periphery with a blue and yellow, which, for the centre is as intense as the red and green, the same blue and yellow must appear comparatively more intense colours. Consequently, we should expect to find a wider field for these colours than for the red and green, and such is the fact. The difference in favour of the blue and yellow is especially large in highly pigmented individuals, as in them the yellow pigment is more intense. As to the red and green, these colours are perceived at the same distance from the centre. So we only need to use alternately one of these colours, and in this way time may be saved in mapping out the fields for the four principal colours.

Abstract of Paper on "Primary Retinal Hæmorrhage in Young Men."

Mr. Henry Eales, Birmingham.

Under the above title it is proposed to deal exclusively with a rare form of retinal hæmorrhage, which is believed to be peculiar to young men between the ages of puberty and adolescence, is usually profuse, constantly recurring, and most common in the left eye.

Characters of the Retinal Affection.—The hæmorrhages are usually multiple, often cause complete opacity of the vitreous, and when quite recent are of a venous colour.

Though occurring at all parts of the fundus, they are most common at the extreme periphery of the retina. They are not associated with any other evidences of retinal disease, and are roundish, diffused, and not flame-shaped. They constantly recur, they are generally found in close proximity to the branches of the retinal vein, which are often lost in them, or a venous trunk is directly continuous with an opacity in the vitreous caused by the hæmorrhages. Vision often appears to be impaired only in proportion to the opacity of the vitreous. In some cases, the recovery is so complete that between the attacks no trace of the previous disease is found.

In all of my own cases the hæmorrhages occurred most profusely in the left eye, but in two cases hæmorrhages were found in the right eye also. In all of my own cases the calibre of the retinal vessels was unusually large in both eyes, the veins especially being dark, large, and tortuous.

In two of my cases the retinal veins at the periphery were found to present remarkable corkscrew-like tortuosities, while surrounding these were evidences of previous retinal hæmorrhages. In one case, sight was permanently lost by the occurrence of glaucoma.

General Condition of the Patients—All were young males, the youngest being aged 14, and the eldest aged 20. All were previously, and while under treatment, troubled constantly with constipation, and occasionally with epistaxis, especially during the summer months. Two were very subject to headaches, three were habitually lethargic and indolent, and complained of depressing feelings and want of energy.

In one case, there was evidence of mitral incompetence. In the others, the heart presented no anomaly. The pulse in each case was below 60 at the time they first came under observation. The aortic second sound was accentuated in only one case. Pulse-tracings in three cases showed low tension, but they were taken some months after the hæmorrhages occurred; the condition of pulse-tension at the time of the hæmorrhage is therefore still undetermined.

In two cases only, there was the faintest shadow of albumen in the urine, and in no case were any casts found.

There was no indication of anæmia in any case; the blood of one case examined by the hæmo-cytometer was quite normal.

Among the exciting causes were coughing, laughing, and stooping.

The family histories were destitute of any decided facts in favour of Mr. Jonathan Hutchinson's view of the gouty origin of this condition, but it is interesting to note that in two cases the fathers had been subject to epistaxis for many years in early life.

The characters and the position of the hæmorrhages point to their origin from the turgescent venous system. This venous turgescence is regarded as the consequence of a neurosis affecting the whole splanchnic area, leading to vasomotor constriction, and muscular inhibition within that area, and compensating hyperæmia of the parts outside, especially of the vessels of the head and neck.

On the Connection between Optic Neuritis and Intra-cranial Diseases.

Professor Theodore Leber, Göttingen.

Mr. President and Gentlemen,—In complying with the kind invitation I have received to read a paper before you on the Connection between Optic Neuritis and Intra-cranial Diseases, I desire, at the outset, to bespeak your indulgence for the somewhat hypothetical character of my paper. I propose to present to you the different theories which have been put forward upon the subject, and to give you at the same time my own views, which I have tried to strengthen, so far as possible, by new investigations. I would have preferred to hold back my opinions until I could have supported them with decisive proofs; but I hope now, at least, to bring forward some points which may serve to excite discussion, and to stimulate to further research.

The most important question which here awaits our decision is admittedly the following:—How does inflammation of both optic papillæ arise in disease of the brain, although the optic nerve itself, the connecting link between brain and eye, presents no sign of inflammation to the naked eye? Especially how are we to explain the occurrence of papillitis in coarse disease, particularly in tumours of the brain, when, as post-mortem examination shows, these diseases are unaccompanied by meningitis, and need not stand in any direct communication either with the optic centres or with the nerve trunk? How are we to explain it, further, in cases of basilar meningitis, when the autopsy discovers no extension of the inflammation to the nerve trunk?

Hitherto these phenomena have been mostly explained by the aid of mechanical causes, especially as the result of some obstacle to the free escape of venous blood from the eye, supposed to be due, it may be, to compression of the cavernous sinus from increased pressure within the cranium, or it may be to pressure upon optic nerve from a dropsy of its sheath. I shall try to show that these theories, ch attempt to explain in a mechanical way the connection of which I am treat- are insufficient and unsatisfactory, and that a cause directly exciting to mation must be adopted as the explanation, and I shall attempt to indicate in which this may come about.

begin with the changes in the eye. It is now universally admitted that the tion formerly made in the ophthalmoscopic appearances between so-called tion-papilla, or choked disc, and descending neuritis cannot any longer be ained. No doubt the ophthalmoscopic appearances, apart from the different of the process, present great varieties in the individual cases; at one time considerable and very steep swelling of the papilla, with great congestion eins will be found, again a more moderate prominence gradually shelving surrounding retina, with considerable participation of the latter in the

inflammation. These, and other, differences in the ophthalmoscopic appearances do not, however, depend upon the nature of the fundamental disease, nor upon the presence of meningitis, and they are accordingly of no importance for the question as to the development of the optic-nerve process. Moreover, the separation into two distinct processes is disproved by the post-mortem examination, according to which a descending neuritis apparent to the naked eye rarely occurs, and is just as seldom found in meningitis, where one would most expect it, as in cases of cerebral tumour.

It seems, therefore, that with the exception of simple atrophy, we have to deal with but a single kind of disease of the optic nerve in cerebral diseases, and this may be described indifferently by the terms papillo-retinitis, or papillitis encephalopathica.

Now this papillitis is a true inflammation, and not merely an œdema caused by passive venous congestion. The tissue changes produced by it are the same as those which occur in the different kinds of hæmorrhagic retinitis, as it is found in certain general diseases, such as nephritis, diabetes mellitus, leucæmia, pernicious anæmia, cardiac disease, &c., and is equivalent to the red softening of the brain, or encephalitis. These changes consist in inflammatory œdema with exudation of fibrin into the interstices of the tissues, infiltration of lymph-corpuscles, hypertrophy and proliferation of the radial fibres of Müller, hæmorrhages, masses of granular cells, thickening of the nerve-fibres, &c. In all the above-mentioned diseases we find always these same changes, no doubt in very different degrees of development, and varying in their distribution over the retina, sometimes one alteration, sometimes another being more prominent, while again, others are less apparent or completely wanting. Upon this variation depends the characteristic ophthalmoscopic picture from which we can often diagnose the nature of the fundamental disorder, while the details of the histological alterations in the retina have nothing pathognomonic in any of the diseases referred to. Moreover, as you know, even the ophthalmoscopic pictures pass over into each other, so that the differential diagnosis is often uncertain. In some rare cases of Bright's disease, for example, the typical picture of the so-called congestion-papilla is seen, and, on the other hand, with cerebral tumour one occasionally finds a form of papillo-retinitis, which in no particular can be distinguished from the most marked retinitis albuminurica. We learn here that the so-called choked disc can develop itself without any cause of venous obstruction; this is also proved by the anatomical examination of some cases of phthisis bulbi following upon injuries, in which the highest degree of swelling of the optic disc, much more extreme than is usually found with cerebral tumour, and with quite the same histological alterations, may be observed under conditions where the cause is only to be sought in transmitted inflammation, and not in an obstacle to the escape of venous blood from the eye.

It is also an error to believe that a stage precedes the appearance of the actual papillitis, in which only œdema and passive venous congestion are present. In the first stage, apart from the hyperæmia, the swelling of the papilla is chiefly due to the well-known thickening of the nerve fibres of the retina, in addition to which there is a slight increase in the nuclei, and an infiltration of small round cells especially along the vessels, alterations of which the last one at least is undoubtedly to be considered as inflammatory. I have found this in two cases in which, with the ophthalmoscope, I saw the process developing, and in which I was enabled to obtain a post-mortem examination of the eye a few days afterwards. Occasionally, too, there is a remarkable increase in the number of the small vessels and capil-

laries; in rare cases an almost teleangiectatic condition of the disc, which I believe to be equally of inflammatory origin. I cannot enter here into the details of post-mortem examinations published by different authors, but as far as I know, no case has been described in which the alteration consisted merely in passive venous hyperæmia and pure passive œdema.

A principal reason for the assumption that the encephalopathic papillitis is caused by passive venous congestion has always been found in the peculiar form of the hyperæmia, marked as it is by extreme dilatation and tortuosity of the veins, while the arteries retain their normal dimensions, or are even contracted. It was thought that the same cause which prevented the outflow of blood through the veins diminished also the influx through the arteries. But there are strong arguments against this reasoning. Even five years ago, E. Jäger had already very properly raised objection to it. The same condition of these vessels is found in general in the most different kinds of retinitis, and it cannot therefore be employed as a proof that in this form a mechanical cause for the inflammation exists. I leave undecided what the cause of the deficient dilatation of the arteries may be, and I will also not reject the opinion that the swelling of the tissues may act as an impediment to the circulation; but this factor would act only in a secondary way, or equally as in the other forms of retinitis, and cannot be regarded as the actual cause of the process. Further, the assumption of a venous obstruction should involve the equal dilatation of the veins over the entire retina, while, as we know, it culminates at the papilla and its immediate neighbourhood, and at but a short distance diminishes in a marked degree. One would also expect that the tissue changes would extend similarly over the whole retina, as it occurs—*e.g.*, in thrombosis of the central retinal vein. Even in complete thrombosis of this vein, however, Michel of Wurzburg found no swelling of the papilla, but the whole retina closely packed with small hæmorrhages, a picture widely differing from that of the so-called choked disc.

It must be doubted all the more that the papillitis in cerebral disease depends upon passive hyperæmia, inasmuch as, under other circumstances, obstruction to the return of the venous blood gives rise to no genuine inflammatory process. Even if we were to admit this possibility for very high degrees of venous congestion, it would not materially affect the position here, because the obstruction to circulation can be but a moderate one, as may be concluded from the fact that normal vision is so frequently retained.

Finally, the mechanical theory affords us no explanation as to why, notwithstanding the continuance of the cause of the hyperæmia, yet the latter diminishes after a time, and the condition passes over into that of atrophy, a succession of events which may be observed in every intense papillitis or retinitis.

The investigation of the changes in the eye shows us, therefore, an inflammatory process, which has its point of greatest development at the papilla, and loses itself gradually in the retina, an appearance which admits of the supposition of an inflammatory irritation transmitted from the brain, and operating only on the portion of the retina nearest the central organ.

If this is admitted, we need not delay long in examining the two different theories on which a mechanical explanation is adopted. We have at first the theory of Von Graefe, based upon the compression of the cavernous sinus from increased intracranial pressure. This view was given up when we became acquainted with the wide anastomoses of the veins of the orbit with those of the face and temporal region, which, should an impediment to the flow through the cavernous sinus occur,

would open up collateral outlets for the venous flow from the retina. I must not omit to mention here, that even the most extreme congestions in the great veins of the body react but little, or not at all, upon the vessels of the interior of the eye, as is shown by clinical observations, and by experiments upon animals. A case which occurred in one of Professor Ebstein's wards, at Göttingen, was, for me, very instructive from this point of view. It was a case of sarcoma in the anterior mediastinum, in which the autopsy showed that the tumour had obliterated the left innominate vein, and had grown far into the superior vena cava, in consequence of which the lumen of the latter was very much contracted. During life the most extreme congestion of all the veins of the upper part of the body existed, and also of the orbit, as the presence of double exophthalmos showed. Nevertheless, the ophthalmoscopic examination discovered not only no choked disc, but not even any marked dilatation of the retinal veins.

The other theory in question is that of H. Schmidt and Manz, according to which dropsy of the sheath of the optic nerve gives rise to the papillitis, by the fluid contained in the distended sheath exercising pressure on the optic nerve at its entrance into the eye. There are also important objections against this theory. Apart from the fact that the tension of the fluid is usually but slight, so that it probably never can give rise to any great pressure upon the central vein or the optic disc, there are several cases on record in which at the autopsy, although performed with the greatest care, no dropsy of the sheath of the optic nerve was found; so that in any case only a very slight quantity of fluid could have been present, although during life well-marked papillitis existed. The theory of a lymphatic congestion in the optic nerve, in which also refuge has been taken, is wanting in anatomical support, for the lymph-spaces in the lamina cribrosa, supposed to be in direct communication with the inter-vaginal space, and into which the fluid from the dropsy of the sheath is supposed to be driven, have not again been found on repetition of the injection experiments, and this I can corroborate from injections I have myself made.

A very important objection to this theory lies in the observation that the choroid immediately around the optic disc takes part in the hyperæmia and infiltration with lymph-corpuscles. I had formerly noticed this condition of the choroid in several cases which I examined, some of them cases of cerebral tumour, others of tubercular meningitis (without tubercle in the choroid), and since I have paid attention to it, I have found it more or less developed in every case; and quite lately, in four cases of cerebral tumour, which Dr. Deutschmann examined for me. Formerly, when compression of the cavernous sinus was believed in, this condition of the choroid was not taken much notice of, because there did not seem anything remarkable in the fact of the choroid taking part in the congestion; and it was wholly disregarded in connection with the theory of dropsy of the sheath of the optic nerve, which affords no explanation for it, inasmuch as, owing to the independence of the vascular systems of the retina and choroid, the effect of compression of the central vein of the retina cannot be transmitted to the choroidal veins. As the inflammatory changes in the choroid, like those in the retina, are confined to the immediate neighbourhood of the optic disc, this circumstance corroborates once more the supposition of an inflammatory excitation transmitted to the eye through the optic nerve.

I have to mention one more theory, which refers papillitis encephalopathica to the intermediation of the vaso-motor nerves. This view has but lately obtained the support of so important an authority as Dr. Hughlings Jackson, although he has

not omitted to mention the objections which may be raised against it. As yet no one has demonstrated these nerves, and it is difficult even to imagine what course they may take, because, as we know, tumours occupying every position within the cranium give rise to papillitis; and yet, nerves which would produce a reflex effect upon the vessels in the eye, cannot have their origin in every part of the brain; and, moreover, it is difficult to understand why the vaso-motor effect should be confined to the eye. Finally, the belief that true inflammation can be caused either by irritation or paralysis of vaso-motor nerves, has almost completely lost its former position in pathology; and even one of the last of the examples which seemed to support the theory—namely, sympathetic ophthalmia, is now more correctly explained as depending upon a neuritis migrans. If, notwithstanding these considerations, the vaso-motor theory still has its supporters, the reason may be that a purely mechanical theory has not afforded satisfaction, and that the existence of an inflammatory irritation has been assumed. I thoroughly sympathize with this feeling, but I believe it may be satisfied in another way. In order to do so, we have still to investigate whether the anatomico-pathological conditions are really irreconcileable with the theory that the optic nerve effects the transmission of an inflammatory process from the brain to the eye. If we confine ourselves to an examination with the naked eye, we find, as a rule, no sign of inflammation, but the microscopical examination very often shows inflammatory changes in the optic nerve. We find perineuritis, neuritis interstitialis and medullaris; and, in short, a normal naked eye appearance of the optic nerve does not exclude even an advanced degree of degeneration in it. And here the microscopical examination is decisive. What should we know to-day about the so-called choked disc, were we without the ophthalmoscopical appearances, and had we to depend upon the naked eye appearances of the optic disc after death? When in such cases practised observers often enough cannot trust themselves to say that they see any diseased condition in the optic disc, we cannot expect to have changes in the optic nerve which would be more visible to the naked eye. But yet there are cases in which, owing to hypertrophy of the inter-vaginal tissue, the inflammation can be recognized with the naked eye. In order to be quite sure of its condition, the optic nerve must be examined in its entire length, and no value can be attached to autopsies where this point has been neglected. By this means I have been enabled, as a rule, to discover inflammatory changes of a more or less marked kind. In but one case which I examined did I not succeed, although softening and atrophy of some of the nerve-fibre bundles was present. This latter condition, I think, we may fairly refer to a former inflammatory process, for we know that, as regards the optic disc, inflammation results in atrophy after a certain time. It would seem, indeed, that the optic disc suffers in a higher degree than the nerve itself; and this may, perhaps, depend on the greater delicacy of the retinal structure, or perhaps it shows that the cause of inflammation acts more severely on the optic disc.

So far we have relied upon anatomical facts, which have given evidence of an inflammatory process transmitted from the brain to the optic nerve trunk and disc. As to the cause of the inflammation I propose the following theory. I would seek the cause in the fluid which is driven into the optic sheath by the increased intra-cranial pressure—the so-called hydrops vaginæ—and which is found both in cases of cerebral tumour and in meningitis, when papillitis is produced. If we ascribe the property of setting up inflammation to this fluid, then the development of the papillitis, the restriction of the inflammation to the immediate neighbourhood of the optic disc, and the participation of the choroid, are

completely explained, as well as the more active affection of the optic disc, as compared with that of the optic nerve; for the fluid is collected in greatest quantity in its neighbourhood, and must there give rise to its greatest effect. Even the absence of a distinct dropsy need cause no difficulty in the acceptance of this theory, for it depends, not so much on the quantity as on the quality of the fluid.

A very important confirmation of this theory is supplied by experiments on animals, which Dr. Deutschmann, of Göttingen, has just published, on the consequences of the inoculation of tubercle in the interior of the cranium. He has succeeded in keeping young rabbits, into the cavities of whose crania he had injected tubercular pus, alive for weeks and months, and in observing the consequences of the injection with the ophthalmoscope. In these experiments, two kinds of alteration were developed in the optic nerve: at first, a simple inflammation, quite similar in ophthalmoscopic appearance, and in the anatomical alterations, to optic neuritis in meningitis tuberculosa of man; and afterwards, an eruption of miliary tubercules in the sheath of the optic nerve, in the optic disc, and even in the vitreous humour. The development of specific tubercular productions proves that some tubercular substance or virus passed from the cranium into the inter-vaginal space, where it must have acted at first as a simple irritant. In a similar way, we have to picture to ourselves the effect of certain coarse diseases, especially of cerebral tumours, concerning which Dr. Hughlings Jackson has emphatically insisted that they play the part of foreign bodies. We can hardly regard this action, which may make itself felt at considerable distances, as other than a chemical one. If we could substitute for the tumour a bit of glass or disinfected wood, we should find just as little inflammatory action to follow, as after a cerebral hæmorrhage, where the extravasation is also to be regarded as a foreign substance, or, as I have ascertained by numerous experiments, after the introduction of chemically indifferent foreign bodies into the anterior chamber of the eye, or into the vitreous humour.

The power of cerebral tumours and of tuberculosis to excite inflammation is likewise the cause of the internal hydrocephalus which regularly occurs with them. The high pressure under which this fluid is secreted, the great flattening of the cerebral convolutions, and the diminution of space within the cranium, point to the inflammatory nature of this exudation, just as is the case in sub-retinal exudations with choroidal tumours, which, with a great increase of the intra-ocular pressure, gradually produce complete absorption of the vitreous humour. When tumours occur on the surface of the body—among other places, on the eye—we see often to what great distances the inflammatory congestion of the surrounding vessels extends, and we can then readily picture to ourselves the processes within the cranium.

In order to sum up my views, I would put forward the following propositions:—Intra-cranial tumours, as also tuberculosis, give rise to congestion of the vessels, secretory inflammation, hydrops ventriculorum, and increased pressure. The products of tissue-change of those neoplasms which become mingled with the inflammatory transudations, act as an inflammatory stimulus, and, passing with the cerebro-spinal fluid into the inter-vaginal space of the optic nerve as far as the eye, give rise there to neuritis and papillitis.

De la Névrite Optique dans ses rapports avec les maladies intra-crâniennes.

Dr. Bouchut, Paris.

D'après une étude poursuivie pendant vingt ans, et après avoir recueilli plus de 1200 observations ou résultats d'autopsie, je crois pouvoir dire que toutes les maladies importantes du cerveau ou de la moëlle épinière, et que les diathèses graves se reconnaissent au fond de l'œil par des altérations du nerf optique, de la rétine ou de la choroïde. C'est ce que j'ai appelé "Cérébroscopie." En effet, dans les troubles fonctionnels du système nerveux, l'hypérémie et le gonflement du nerf optique annoncent la congestion cérébrale ou méningée, la compression du cerveau, ou le début d'une maladie spinale. L'œdème de la papille et de la rétine avoisinante annonce l'œdème des méninges et l'obstacle à la circulation des sinus et des veines méningées dans la méningite tuberculeuse, dans l'hydrocéphalie aiguë, dans l'hydrocéphalie chronique, l'hémorrhagie cérébrale, certaines tumeurs cérébrales accompagnées d'encéphalite, &c.

L'anémie névro-rétinienne absolue annonce l'arrêt de la circulation cardiaque et cérébrale. C'est la mort, qu'il est très-facile de constater par l'ophthalmoscope.

Les varices et les thromboses rétiniennes annoncent thromboses des sinus et des veines méningées.

Les anévrismes miliares des artères de la rétine annoncent les anévrismes des artères du cerveau.

Dans les fièvres et les maladies du système nerveux, des hémorrhagies de la rétine indiquent la compression du cerveau par un fort épanchement, la diathèse hémorrhagique, un obstacle à la circulation cérébrale provenant du cœur, ou les altérations des vaisseaux du cerveau et de la rétine par l'albuminurie chronique, la glycosurie, la syphilis ou la leucémie.

Les granulations tuberculeuses de la rétine et de la choroïde annoncent la tuberculose du cerveau ou des méninges.

Enfin, dans les affections nerveuses, l'atrophie papillaire ou sclérose du nerf optique indique toujours une sclérose disséminée du cerveau ou des cordons antérieurs de la moëlle.

Des Thromboses vasculaires amenant des névrites optiques ou des signes d'embolie.

Dr. Galezowski, Paris.

Messieurs,—L'anatomie pathologique nous a démontré, que dans les névrites optiques cérébrales, les vaisseaux du nerf optique subissent une oblitération, et qu'il existe des signes évidents d'endoartérites ou de périartérites dans le nerf atrophié. D'autre part nous savons qu'il existe des dépôts calcaires, des dégénérescences graisseuses, des scléroses, des parois, comme Liber, Manz, Muller l'ont démontré, soit dans les branches principales de l'artère centrale, soit dans les artères périphériques de la rétine.

Ce qui existe dans les vaisseaux rétiniens, a été observé aussi dans les vaisseaux cérébraux. Charcot a démontré qu'il existe des endartérites oblitérantes, et Lan-

ceraux a trouvé des périartérites et des artérites syphilitiques. Dans les névrites optiques cérébrales on trouve des oblitérations vasculaires et des thromboses.

Mais, quels sont les phénomènes que présentera un œil atteint de ces altérations, et sous quelle forme ophthalmoscopique et fonctionnelle reconnaîtra-t-on la maladie? Tels sont les problèmes que je me suis proposé de résoudre, et j'apporte ici les résultats de ces recherches, qui me paraissent présenter à plus d'un titre un intérêt pratique.

Les altérations artérielles qui s'observent dans les vaisseaux rétiniens sont de deux sortes :—les unes qui amènent des troubles visuels lents, progressifs, comme ceux, par exemple, que nous observons dans la névrite optique cérébrale ou dans la rétinite albuminurique ; les autres, au contraire, amènent des phénomènes instantanés foudroyants, à tel point que les malades perdent la vue d'une manière subite, comme dans l'embolie de l'artère centrale.

L'analogie entre ces endartérites oblitérantes et l'embolie est tellement grande, que jusqu'à présent tous les auteurs ont confondu ces deux maladies. Aussi, on voit un individu atteint d'une amaurose subite d'un œil, avec rétrécissement des artères rétiennes et infiltration ou suffusion périvasculaire, et on déclare qu'il s'agit d'une embolie.

Depuis plusieurs années, j'étais déjà frappé de ce fait que chez un certain nombre des malades atteints d'embolies rétiniennes, je ne trouvais pas la moindre trace d'affection cardiaque. Je ne voulait pas me fier à mes propres investigations du cœur, et j'ai adressé mes malades les uns au Professeur Lasègue, d'autres au Professeur Peter, à mon regretté ami le Docteur Maurice Raynaud, d'autres à Charcot et à Patain.

Il résulte de ces examens contrôlés par les praticiens les plus éminents de Paris, que sur 99 cas d'embolies, il y a eu dans 13 cas absence complète de toute altération du cœur. Des tracés sphygmographiques ont été faits à la clinique du Professeur Patain chez quelques—uns de ces malades, et qui ont démontré l'état normal de la circulation artérielle.

Mais, si on recherche les causes probables de ces différents cas d'oblitération artérielle, on trouve des indications très-intéressantes à cet égard. C'est ainsi que j'ai observé dans trois cas une relation entre les accès de fièvre intermittente pernicieuse et l'oblitération de l'artère rétinienne ; trois fois la maladie était due à la syphilis ; une fois elle a suivi de très-près une chute sur la tête ; deux fois je l'ai vue survenir à la suite d'un fort accès de colère ; chez une malade il y a eu une aortite, comme Potain, avait constaté, ce qui pouvait à la rigueur amener soit embolies soit thromboses ; enfin, dans deux cas on ne pouvait pas rattacher l'oblitération des vaisseaux rétiniens à aucune autre cause qu'à la migraine ophthalmique.

Le tableau statistique pourra, du reste, renseigner sur plus d'un fait étiologique important de l'embolie et de la thrombose rétiniennes.

D'autre part, en analysant attentivement tous les symptômes qu'accusent les malades atteints de l'une et de l'autre de ces affections, on trouvera quelques signes distinctifs.

Tableau statistique de 46 Cas d'Embolies et de 13 Cas de Thromboses rét

Age	10–20	20–30	30–40	40–50	50–60	60–70	70–80
	4	11	12	13	27	25	9

Sexe	Hommes . . . . . 15 Femmes 44	Embolie . . .	
Œil gauche . . . . . 41 Œil droit 17		Thrombose artérielle .	

Fièvre intermittante . . . . . .
Syphilis . . . . . .
Chute sur la tête . . . . . .
Emotion vive ou colère . . . . . .
Aortite . . . . . .
Migraine ophthalmique . . . . . .
Goutte .. . .
Accidents cérébraux accompagnant l'embolie ... .

Il y a dans ce tableau 13 cas, dans lesquels on pouvait rapporter les oculaires à toute autre cause qu'à une affection cardiaque. Mais sur les cas, il est probable qu'il se trouve un certain nombre des malades ton dents emboliques devaient se rapporter aussi à une thrombose, mais à c mon attention n'était pas attirée de ce côté, et j'ai pu confondre les deux en ne me basant que sur un seul fait des symptômes ophthalmoscopiq ressemblent entre eux.

Il serait donc important de rechercher dans la symptomatologie ainsi les indications étiologiques, des signes caractéristiques qui permettent d' diagnostic différentiel entre les deux affections.

C'est ainsi, que la perte de la vue, quoique subite, est précédée, le plu de quelques symptômes prodromiques. Un de mes malades voyait, pend mois consécutifs, constamment des bluettes devant l'œil malade; un a dant les trois jours qui ont précédé l'attaque, voyait de plus en plus : un autre, des douleurs périorbitaires venaient par crises pendant un m cessaient complètement qu'avec la perte de la vue. Les thromboses don lieu bien plus souvent que les embolies aux hémorrhagies rétiniennes q pagnent l'infiltration séreuse périvasculaire ainsi que les autres signes d'

The Pathological Changes in Retro-bulbar Neurit (Central Amblyopia).

Dr. Samelsohn, Cologne.

The specimen on which this communication was based has alre described in its relation to the anatomy of the optic nerve (*Centralbla Wissensch.* Berl. 1880); and the author proposes to publish it, with further detail elsewhere.

The following is an abstract of the paper presented to the Congre microscopical specimens and drawings were demonstrated by the author :

1.—The anatomical condition of the disease described as central amblyopia is a true retro-bulbar neuritis.

2.—This neuritis is essentially a primary inflammation, which results in contraction and a consequent descending pressure-atrophy.

3.—This interstitial neuritis appears to be localized at the canalis opticus.

4.—In typical cases this neuritis affects only the bundles of fibres which supply the macula lutea.

5.—These bundles do not run a straight course in the intra-orbital part of the nerve, but they decussate with other fibres in order to appear finally on the lateral aspect of the nerve.

6.—The inflammatory nature of the disease demands an energetic resolvent treatment.

DISCUSSION.

Professor Dor, Lyons, stated that in his experience true colour-blindness did not occur in any diseases limited to the eye itself, nor even in papillitic atrophy of the disc; the defect for colours in all these cases corresponding in degree with the defective acuteness of vision. But defective colour-sense—*i.e.*, defect greater than the loss of acuteness of vision—was always present in toxic amblyopia, and in atrophy whether from sclerosis of optic nerve, or from central disease. He concluded from these facts that the seat of colour-perception is in the brain, and not either in the eye or the peripheral parts of the optic nerve.

Dr. Hughlings Jackson, London: In adverting to Dr. Leber's mention of my acceptance of the vaso-motor hypothesis, I must remark that I hold this hypothesis very loosely. In a paper read this year at the Ophthalmological Society, I only said that the vaso-motor was "the most plausible" of the three hypotheses I then knew of; there is now a fourth, that of Leber. I would state some of the facts which I think ought to be considered in relation to any hypothesis. The most important is that optic neuritis may exist with good sight, and may, under treatment, pass off, leaving sight good. I would urge that headache and vomiting, so often occurring with optic neuritis, ought to be considered as equally requiring investigation and explanation.

Dr. Parinaud, Paris: I would refer to an article which I published in 1879 (*Ann. d'Oculist.*), in which I arrived, though by a different way, at conclusions nearly the same as those of Professor Leber—viz., that optic neuritis in intra-cranial disease was the result neither of venous stasis nor of vaso-motor irritation; that increased intra-cranial pressure alone, however produced, could not cause it; and that effusion into the optic nerve-sheath was only of secondary importance, and could not, by compression, cause changes at the disc. I consider that optic neuritis in cerebral diseases is primarily a lymphatic œdema connected with hypersecretion of the cerebro-spinal fluid. This œdema occurs in the same way as that of the brain-substance under the same conditions, and is the starting-point of the inflammatory process. Though it may be of passive nature, it seems more prone to cause inflammatory lesions than œdema by venous stasis. Though the histological changes (in the nerve) were those of true inflammation, this was not, in my opinion, the result of direct connection with intra-cranial lesion. The optic neuritis was, even in acute meningitis, I affirmed, related to hypersecretion of liquid, and not either to the intensity, quantity, or position of the meningeal exudation.

Optic neuritis in intra-cranial diseases indicated cerebral œdema. As this œdema nearly always occurs in cerebral tumour, as well as in meningitis with hydrocephalus, neuritis is to be taken as an almost certain sign of ventricular dropsy, although this dropsy is not indispensable for the production of the optic nerve disease.

Dr. Stephen Mackenzie, London: I concur with Professor Leber in rejecting the theories of venous stasis due to diminished intra-cranial space, and of irritation of vaso-motor nerve, as the usual causes of optic neuritis in connection with coarse intra-cranial disease. I think that the theory of Professor Leber would explain many cases. But we meet with cases where there is no evidence of serous effusion (internal hydrocephalus), and in which this theory, to me, fails to explain the neuritis. I have published a case of neuritis without naked eye appearance of disease, but in which microscopy revealed general diffused cerebritis. There was no evidence of meningitis, and no distension of the sheath of the optic nerve. I believe that in such cases the neuritis is explained by a direct extension process from the brain. This view is supported by microscopic examinations of the trunk of the optic nerve, by Dr. Gowers, Dr. Walter Edmunds, and others, who have found, like myself, increase of nuclei throughout its length, chiefly in the course of the blood-vessels. Further, in some published cases of unilateral neuritis from cerebral tumour, with post-mortem examinations, it is remarkable that the neuritis was on the side opposite to the tumour. It seems to me that such cases are unexplained by increased intra-cranial pressure, or by a vaso-motor theory, or on Professor Leber's theory; but that they are explained by a direct extension process. The same explanation would apply to other cases where there is no evidence of meningeal effusion. There may be, I think, one of two processes which are usually in action in causing the optic changes—viz., either (1) direct extension of the central change, inflammation, atrophy, &c., to the optic nerve; or (2) like tissues being affected in a like way by one influence, as in Bright's disease, diabetes, ague, anæmia, leucocythæmia, &c. Still, Dr. Leber's theory may explain cases where serous meningeal effusion occurs.

Dr. Poncet, Cluny: Optic neuritis from meningitis is chiefly situated in the tissue of the neuroglia; it consists in an accumulation of nuclear elements with œdema; but the interstitial vascular connective tissue is free. It is the neuroglia that is chiefly implicated in the degeneration of the nerve. Optic neuritis is not produced in animals by irritation either of the sympathetic or fifth nerves.

Professor Laqueur, Strasbourg, agreed with Dr. Galezowski and others as to the absence of evidence of heart-disease in many of the cases of so-called embolism; in seventeen such cases he had found cardiac disease in scarcely eight. The symptoms might be due to true embolism, or to thrombosis, or to hæmorrhage into the optic nerve. True embolism was probably the explanation of the cases where the permanent symptoms were preceded by a passing attack of blindness.

Professor Panas, Paris: My experience of papillary stasis (stauungs-papilla) points to the following conclusions in traumatic lesions of the brain (commotion, concussion, contusion, fractures, and gun-shot injuries). The presence or absence of swollen disc does not help us either in the diagnosis or prognosis of the lesion;

patients showing this condition may recover, though the swelling continues during their convalescence. Post-mortem examinations have shown that when there had been swelling of the disc, the sub-vaginal space was always distended by serous or bloody fluid; whilst this distension was entirely wanting in cases where no stauungs-papilla had existed during life.

Dr. KNAPP, New York: In support of the theory of Professor Leber, I would like to mention that orbital tumours frequently cause the highest degree of exopththalmos, but no choked disc. Only when they encroach upon the sheath of the optic nerve, especially the non-capsulated malignant tumours of the periosteum, do they cause neuro-retinitis. As to the curability of choked disc, of which Dr. Hughlings Jackson has spoken, I beg to state that I have seen a few marked cases combined with headache and vomiting, in persons of tuberculous families, recover not only their full sight, but also a normal aspect of the optic nerves. Moreover, I desire to mention those cases to which Dr. Kipp, of Newark, N.J., first drew the attention of the profession (in the *Archives of Otology*), and of which I have also seen a few instances; I mean choked disc caused by purulent meningitis from suppurative otitis media. They get completely well when, with the ear disease, the consecutive meningitis is also cured.

Dr. PAGENSTECHER, Wiesbaden: I ask Professor Leber whether, in the experiments to which he has alluded, where tubercular material was injected into the brain, any deposits of tubercle were found in other organs than the optic nerve and retina? The reply to this question appears to me to bear in an important manner on the conclusions which can be drawn from the experiments.

Professor LEBER, Göttingen: The experiments I alluded to were not made by me, but by Dr. Deutschmann, assistant at the Ophth. Clinic of Göttingen. Tubercular pus was injected into the cranial cavity of young rabbits, and the animals survived this operation for weeks and months. Some of them died spontaneously, others were killed at different times after the inoculation. In all cases post-mortem examinations were made, and the different organs examined, aided, if necessary, by microscopic research. In the first stage, there were found quite the same alterations as in tubercular meningitis of man; the optic nerve in its intra-cranial portion being normal, while in the region of the orbit a dropsy of the sheath was present, accompanied with some perineuritis and neuritis interstitialis, which increased as the eye was approached. Sometimes this process during life went back into atrophy, which could be observed by the aid of the opthalmoscope. In the further course of the disease, miliary tubercles became developed in the sheath of the optic nerve, in the papilla, and even in the vitreous humour. The result of the examination showed evidently that the inflammatory process was propagated in some way from the intra-cranial cavity, and the greater development of the changes at the anterior end of the optic nerve seemed to be attributable to the entrance of some irritating matter into the inter-vaginal space of the optic nerve.

Dr. BRAILEY, London: Speaking from memory alone, I am strongly of impression that tumours of the orbit can, by simple pressure on the optic nerve, produce neuritis. I have examined carefully the specimens of Dr. Edmunds, alluded to by Dr.

Mackenzie, and I agree that inflammation can be traced along the optic n as far as the brain. This is, of course, consistent with its having spread s from, the meninges, entering the nerve from its pial sheath. The increase c best seen in the walls of the small blood vessels, and in the fibrous stro nerve, though the neuroglial corpuscles are also increased in size. If actu mation can be traced along the nerve-sheath it seems unnecessary to as existence of a phlogogenic fluid.

Prof. LEBER: In resuming the result of our discussion on the c between optic neuritis and intra-cranial diseases I can be short, because points there has been no divergence of opinion. It seems to be generally adm optic neuritis in intra-cranial diseases is a true inflammation, which cann duced by purely mechanical causes, and that the theories which try to ex connection by compression, either of the cavernous sinus by increased int pressure, or by compression of the optic nerve by dropsy of its sheath, o abandoned. There remain, then, only two theories: that of reflex-motor a that of propagated inflammation, a special modification of which I hav defend before you. I shall not enter here any more into the arguments a reflex theory, which has lost to-day, as I believe, much of its former cred allude only to the analogy of sympathetic ophthalmia, for which this about to be abandoned also, as our discussion of yesterday has proved. contrary, the anatomical facts are quite in favour of the supposition th flammation is in some way propagated from the intra-cranial cavity to the to the origin of this inflammation, I agree with the views of Dr. Parin that the serous exudation in the ventricles—which is found as well i tumours as in meningitis, when they give rise to papillitis—is produce inflammatory process, by a kind of encephalitis. Serous exudation also p the intervaginal space, and seems to act here, as I believe, as an irrita optic nerve and disc. We may explain, in this way, how the inflammati always found to be quite continuous, and how it can increase with the dist the central organ. Dr. Stephen Mackenzie seems to prefer for certain ca the inflammatory process is continuous from the brain to the eye, the tion by a direct extension process. But I believe that here there is no r ence of opinion; if we admit that the inflammation is propagated from on another, we have to admit also that the inflammatory irritant, the caus process, must propagate. The cases Dr. Mackenzie has alluded to make, point of view, no great difficulty in the explanation. Dr. Hughlings has hinted at the clinical symptoms, and has very judiciously remarke theory must explain not a single symptom only, but all symptoms. I bel our theory is able to do that, as far as our knowledge goes to-day. It wil as well for the papillitis as for the other clinical symptoms, such as headach &c., which may easily be explained by an inflammatory condition within t cavity. The transitory attacks of severe cerebral symptoms seem to d periodic inflammatory congestions, with increased serous transudation, commonly occur in these neoplasms. But we can go still farther trying the theory in its consequences, and to state if it will prove sufficient. If r fluid driven into the optic sheath is liable to set up an inflammatory s should expect the same consequence in those parts of the brain which c contact with this fluid, especially the walls of the ventricles. In hydroc and in cerebral tumours, doubtless always a considerable softening of the

the ventricles does exist, but this usually is regarded as a post-mortem appearance, although, perhaps, certain changes may exist during life. With regard, however, to hydrocephalus internus in tubercular meningitis, Professor Orth, of Göttingen, has informed me that changes similar to those in the retina really do occur, and that he has frequently observed numerous small hæmorrhages, some on the grey and some on the white substance of the walls of the ventricles. Lastly, I have to mention the papillitis in orbital tumours, in regard to which Professor Knapp has made a remark in favour of the inflammation theory. There is a striking analogy between optic neuritis occurring in diseases of the brain, with increased intra-cranial pressure, and in orbital tumours which exercise a pressure on the eye; and if we ought to refer the development of neuritis in the last case to mechanical pressure, we would be inclined to admit the same explanation for cases of cerebral tumour also. But against this reasoning, we can state at first what Professor Knapp has already mentioned, that papillitis in orbital affections is not constant, and, even in a high degree of pressure on the globe, it does not always occur. Further, this reasoning is in contradiction to anatomical facts. By the kindness of Professor Horner, I have had an opportunity of making the anatomical examination of a case of orbital tumour, in which, as far as I remember, the tumour was not in the immediate vicinity of the optic nerve. I found an enormous swelling of the papilla, just as in cerebral tumours, with a very great distension of the small vessels of the choroid, and infiltration with lymph-corpuscles, which, however, was confined to the immediate neighbourhood of the papilla, whilst the principal branches of the venæ vorticosæ and the other vessels of the choroid were but moderately distended. I cannot account for this condition by mere venous congestion, and I must suppose that by some, as yet unknown, channel, inflammation passed from the tumour to the eye. Accordingly, papillitis, occurring with orbital affections, furnishes still another argument for the inflammatory development of papillitis encephalopathica.

Traitement des Décollements de la Rétine par les injections souscutanées de Pilocarpine.

Dr. Dianoux, Nantes.

Dans un premier travail inséré dans les *Archives d'Ophthalmologie*, je publiais au mois de Novembre dernier les résultats que j'avais obtenus contre le décollement de la rétine par les injections souscutanées de pilocarpine. Cette publication, un peu hâtive peut-être, me paraissait justifiée et par l'importance des résultats et par le désir d'attirer sur ce point l'attention du public médical. Depuis cette époque j'ai pu non seulement ajouter de nouvelles observations, mais encore suivre et contrôler les anciennes de manière à me former une opinion plus solidement assise sur la valeur réelle de la médication.

Cas traités	16
Guérisons absolues	4
Guérisons presque absolues	3
Améliorations	8
Insuccès absolu	1

Voilà ma statistique. Elle exclut toute idée de série fortuitement heureuse.

Pour ne pas abuser des moments si précieux d'un congrès, je me bo donner le résumé de mes récentes observations qui seront publiées en dét la thèse de mon chef de clinique.

Qu'il me suffise d'ajouter qu'aucun des malades qui avait bénéfic médication et dont les observations ont été déjà publiées, n'a subi de re d'aggravation depuis le mois de Novembre.

Observation I.—Le 5 Novembre, 1880. Sœur St. B.——, hospital Maternité de l'Hôtel Dieu; 50 ans, est d'une santé chêtive, asthmatique, des constipations opiniâtres, très-myope, n'a jamais porté de lunettes. La commencé à baisser en Janvier, 1880, puis est tombée brusquement tout réc O.D. V. $= \frac{2}{5}$. O.G. V. $= \frac{1}{30}$. M. $= 10$ D.

Décollement de la rétine gauche très-tendue, corps vitré troublé, 15 i de pilocarpine, puis repos de huit jours.

V $= \frac{1}{20}$; lit No. 9 de Wecker; extension du champ visuel, scléro-c postérieure très-avancée intéressant la région de la macula. Malgré une d'iritis l'amélioration continue, mais vers le 20 Octobre, sous l'influence de tête consécutifs dus eux-mêmes à une constipation opiniâtre, une rechute De nouvelles injections ramènent une amélioration, qui ne s'est pas dément Novembre. Elle lit le No 8.

Le 21 Janvier le décollement n'a plus qu'une épaisseur insignifiante, il bas dans la région équatoriale. Le 15 février on ne trouve plus à cette pla coloration louche. La guérison se maintient.

Observation II.—Land, 32 ans, teinturier, assez maigre, gastralgique, né a été considéré comme tabétique. Abaissement progressif, puis brusq vision de l'œil droit à la suite de fatigue extrême après une journée de foi

Est venu consulter un médecin qui le soigna par les ventouses et les i de strychnine.

Vers la fin de Juillet, 1880, la vue commence à baisser de l'œil ga vient me consulter à cette époque. Je constate O.G. M – 10 diopt. V.= Compte difficilement les doigts.

De ce côté décollement de la rétine occupant le pôle postérieur de décollement est peu saillant.

Sur mon avis le médecin de la localité qu'habite M. L. lui pratique 9 i de pilocarpine. Les trois premières, par erreur dans la dose injectée, p un effet excessif. Le 11 Septembre:—O. G. V.$= \frac{2}{3}$. O. D. V.$= \frac{1}{10}$.

Le malade peut lire le No. 4 de Wecker facilement avec l'œil malade. I un scotome irrégulier, mais seulement relatif. Teinte grisâtre, à ce niv breuses plaques de scléro-choroïdite.

Nouvelle série de 12 injections à la suite desquelles je ne constate p du décollement.

Le scotome relatif qui persistait encore a disparu ultérieurement. La se maintient.

Observation III.—Rondeau, 32 ans, vannier, scrofuleux et alcooliqu d'une affection du foie.

Myope (9 diopt). La rétine décollée vient de ce côté masquer tout le la pupille sauf à la partie interne.

Après 15 injections amélioration considérable; le malade peut lire quelq du No. 10 de Wecker.

Observation IV.—Le 4 Février, 1880. Madame V., 60 ans, exerce la p fatigante de femme de ménage; elle est anémique et se nourrit très-insuffi

Huit jours avant de venir consulter, abaissement subit sans cause appréciable de la vision de l'œil gauche. O.D. M.=2·25. V.=$\frac{1}{2}$.

Madame V. n'a jamais porté de verres.

Œil gauche ne peut compter les doigts.

De ce côté légère cataracte étoilée. Décollement étendu de la rétine, tension diminuée.

Après 15 injections de pilocarpine, agrandissement du champ visuel et éclaircissement notable du corps vitré, malgré une poussée d'iritis vite enrayée par un traitement approprié. V.=$\frac{1}{20}$ sans verre.

Le 29 Mars V.=$\frac{1}{20}$. La malade peut se conduire seule avec l'œil malade dans un milieu bien éclairé. Etat stationnaire jusqu'au mois de Mai; à cette époque à la suite de chagrins de famille et de mauvais traitement, augmentation rapide du décollement, l'œil devient phtisique et tend à s'atrophier; je fais cesser la compression employée depuis quelques jours.

La malade, découragée et en butte à des reproches continuels, de la part de son mari qui l'accuse de perdre son temps, cesse tout traitement.

Observation V.—Le 18 Décembre, 1880, entre à la clinique ophtalmologique de l'Hôtel Dieu la nommée Marie Blaie, lingère, âgée de 23 ans. Elle porte depuis longtemps des verres concaves; malgré cela sa vue a toujours été mauvaise. Je constate sur les deux yeux un décollement étendu de la partie inférieure des rétines, avec trouble considérable du corps vitré. La myopie est de 10 diopt. V.=$\frac{1}{20}$.

Après 15 injections et 10 jours de repos V=$\frac{1}{15}$ avec un verre approprié et la lecture du No. 4 de Wecker est possible, quoique difficilement.

Après 15 nouvelles injections la lecture de ce même numéro est facile. La rétine s'est réappliquée, mais elle conserve une coloration grisâtre qui est due à l'interposition entre la membrane nerveuse et la choroïde, dont on aperçoit la coloration rosée, d'un tissu de nouvelle formation, l'analogue des plaques laiteuses du péricarde ou des fausses membranes de la pleurésie.

Le 10 Mai le champ visuel de l'œil gauche est redevenu normal à son tour, et la malade peut lire le No. 3. Le corps vitré contient encore de nombreux flocons.

En présence de semblables résultats je crois pouvoir dire sans risquer d'être contredit par personne, qu'aucune médication n'a jamais rien produit, à beaucoup près, d'aussi satisfaisant.

Conclusions.—Les injections de pilocarpine méthodiquement pratiquées doivent constituer le traitement principal des décollements de la rétine. Elles sont seules applicables dans les décollements très-limités ou inaccessibles à la ponction.

Ces injections modifient avantageusement dans presque tous les cas, la lésion oculaire.

Cette lésion doit être assimilée aux épanchements des séreuses de cause irritative; le pilocarpine agit comme un révulsif et un dérivatif spécial, qui excite la secrétion des glandes salivaires innervées par la même paire nerveuse qui préside à la secrétion des liquides oculaires, et à un plus haut degré en amenant une déperdition d'eau considérable dont un des premiers effets est la résorption des liquides de nature inflammatoire, suivant les lois de la pathologie générale.

Les résultats produits sont passagers ou définitifs suivant des conditions qu'il est actuellement impossible de fixer absolument.

Les conditions favorables sont la jeunesse du sujet et des conditions sociales et hygiéniques satisfaisantes; le peu de temps écoulé depuis le début de l'affection, l'intégrité, du moins relative, du corps vitré, la conservation de la tension normale

intra-oculaire, le traumatisme ou le froid comme causes, l'absence de ponction antérieure.

Les contre-indications: état de phtisie manifeste du globe ou diminution accusée de la tension, détachement complet de la rétine.

Très-grande ancienneté de la lésion (plus de deux ans).

Etat cachectique du sujet ou lésion cardiaque grave. Les injections devront être pratiquées d'après les règles suivantes.

La solution est aussi formulée:

Nitrate de pilocarpine, vingt centigrammes.
Eau distillée, quatre grammes.*

La dose variera suivant les sujets de 5 à 10 et 15 gouttes. L'effet obtenu devra être une salivation de deux heures de durée au moins.

Chez les sujets jeunes et vigoureux, les quatre ou cinq premières injections pourront être faites à dose suffisante pour amener une abondante transpiration.

Ces injections seront faites à la partie postérieure de l'avant bras.

Elles devront être continuées pendant dix ou quinze jours consécutifs suivant la force de résistance des malades.

Elles seront reprises après 10 jours de repos, et pourront être continuées ainsi pendant plusieurs mois. L'insuccès dans la première série ou un état stationnaire après une amélioration au début ne devront pas décourager.

Les injections devront être reprises à la moindre menace de rechute.

L'emploi simultané du collyre d'atropine peut neutraliser chez certaines personnes mêmes de fortes injections de pilocarpine; elles ne devront donc être employées qu'en cas d'absolue nécessité.

Il va de soi que toutes les précautions hygiéniques appropriées seront prises.

La compression, au début, peut être un utile adjuvant, elle doit être cessée s'il y a menace de diminution de la tension intra-oculaire.

DISCUSSION.

Dr. G. Martin, Bordeaux: I have not been so successful in eight cases of retinal detachment, seven of which were spontaneous, and one traumatic. Pilocarpine was used before operating by puncture, or galvano-caustic, in five, and after operating in six. Each patient had twenty injections of 2 c. gr. The duration of the detachment varied from five days to three months. In five cases the detachment was local, in three it was nearly complete.

Dr. Martini, Rome: I have treated, since 1879, twelve cases of detached retina by pilocarpine injections; complete cure was obtained in 5, decided benefit in 2, temporary benefit in 2, failure in 3. The prognosis is best when the detachment is small and recent; doubtful when it is limited and old; hopeless, when old and very extensive. I prefer nitrate of pilocarpine to hydrochlorate. I begin with 1·5 to 2 c. gr. Salivation and sweating always in my cases lasted 2 to 2½ hours.

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* En France la pilocarpine de Dusquesnel est la seule à laquelle on puisse se fier.

Ueber Pathogenese und Aetiologie des Nystagmus der Bergleute nach Untersuchungen von 7500 Bergleuten.

Dr. Nieden, Bochum.

Gehe ich in Kürze auf das Wesen dieser Ihnen allen gewiss bekannten Erkrankung des Muskelapparates der Augen ein, so besteht der Nystagmus der Bergleute ja eben in einer im spätern Leben erst acquirirten, periodisch auftretenden Augenmuskelaffection bei denjenigen Bergleuten, die in der Dunkelheit des Grubenschachtes ihre Arbeit als sogenannte Hauer zu verrichten haben. Dieselbe äussert sich darin, dass bei herabgesetzter Beleuchtung bei den leichteren Fällen, bei gewöhnlichem Tageslichte bei den schwereren und zwar bei dem Versuche, das Auge nach oben zu drehen, die bulbi der betreffenden Individuen in unendlich rasch erfolgende Drehungen und Rollungen um ihre Vertical resp. Diagonalaxe gerathen, und nicht eher wieder zum Stillstand kommen, als die Augäpfel kräftig nach unten gewendet werden oder die Patienten die Augen schliessen. In Folge dieser unwillkührlichen Augenbewegungen wird bei den betreffenden Patienten Scheinbewegung der gesehenen Objecte vorgetäuscht und werden Schwindelzustände dadurch hervorgerufen.

Bei den höheren Graden dieses Leidens pflegen sich diese Nystagmus-Bewegungen der Augen auch schon bei horizontaler Lage der Blickebenen einzustellen, so dass die Patienten gezwungen sind, schon im gewöhnlichen mit stark zurückgelegtem und streng fixirtem Kopfe einherzugehen, um nicht durch die Schwindelzustände zu sehr gestört zu werden. Zuweilen gesellen sich in diesem Zustande blepharospastische Zuckungen des Orbicularis hinzu, die je stärker werden, je mehr der Patient seinen Blick nach oben richtet und dadurch also stärkeren Nystagmus hervorruft. Bei noch ausgeprägterer Form des Leidens betheiligen sich auch die Musculatur des Halses und Nackens an diesem Tremuliren.

Gewöhnlich sind die Nystagmus-Bewegungen der Augen rein associirte auf beiden Seiten. Nur viermal habe ich unter 299 Fällen dissociirten Nystagmus beobachten können. Einmal fand sich nämlich auf dem einen Auge rein oscillirender Nystagmus, zweimal gab sich auf dem einen Auge eine sehr beträchtliche Affection kund, während das andere Auge nur bei stärkeren Fixationsbestrebungen in leise Zuckungen gerieth und nur einmal konnte ich einseitigen oscillirenden Nystagmus constatiren. Ungleichmässig starke Entwickelung, abwechselnd je nach der Drehung der Blickebene nach oben, innen oder aussen, lässt sich indess in zahlreichen Fällen nachweisen. Die rein rotirende Form wurde in 72 per Cent aller Fälle, die oscillirende in 12·5 per Cent und die gemischte Form in 15·5 per Cent gefunden; horizontaler Nystagmus kam nicht zur Beobachtung.

Bei dem Mangel aller Daten gerade über das procentarische Verhältniss und andererseits die Unwahrscheinlichkeit der bezüglichen Mittheilungen z. B. von Romiée, der in 20 per Cent Nystagmus unter den Bergleuten constatirt haben will, veranlasste mich, Massenuntersuchungen in loco auf den einzelnen Zechen zu veranstalten. Ich liess zu dem Zwecke vor der Früh resp. Mittagsschicht die Bergleute an einem etwas dunklen Orte je einzeln vortreten, fixirte den Schädel mit der Hand in der mittleren Ruhelage, liess dann meinen ausgestreckten Finger der anderen Hand fixiren und hob denselben nach oben hin, wendete ihn links und rechts, machte einige rasche Hin-und Herbewegungen bei stets nach oben gerichteter Blickrichtung des Untersuchten und war damit nach

stattgehabter Notirung des Alters, Art der Beschäftigung, Art des lichtes &c. die Untersuchung beendet. Es wurden hiebei folgend gefunden: Von 7416 untersuchten Bergleuten fand sich acquirirter N deutlich augesprochen in 299 Fällen oder 4·03 per Cent der Gesammtsum grösserem Interesse war es, festzustellen, ob die Ermüdung durch die A so grossem Einflusse auf das augenblickliche Hervortreten des Leiden Romiée behauptet. Ich untersuchte deshalb auf den einzelnen Grube 2003 Mann, die von der Arbeit zu Tage gefördert waren und fand bei d und sechsig mal oder in 3.2 per Cent Nystagmus-Bewegungen der Augen, von den 1913 zur Arbeit einfahrenden Mannschaften sich dieselben bei 55 2·9 per Cent zeigten. Der Unterschied in beiden Zahlen ist ein relativ ge Ungunsten der von der achtstündigen Arbeit zurückkehrenden, und corr wieder nicht mit den hohen von Romiée in diesem Falle gefundenen Zahl

Während bei diesen Zahlenangaben die Bergleute in toto genommen des Vorhandenseins der Nystagmuskranken unter ihnen, und sich hier die 4·03 per Cent herausstellt, ergiebt sich, wenn wir nach dem Auftreten de nur unter den augenkranken Bergleuten forschen, dass sich bei 3017 Jahren wegen Augenleidens in Behandlung getretenen Bergleuten, N 172 mal verzeichnet findet oder in 5·6 per Cent, während sich das proce Verhältniss bei den in diesem Zeitraum behandelten 29,640 Augenleiden Praxis nur zu 0·54 per Cent stellt. Gewiss sind also die erstaunlich hohe von 20 per Cent, &c., selbst bei der Annahme des Vorhandenseins aller m besonderen Schädlichkeiten viel zu hoch gegriffen, und hat sich der B vielleicht durch kurze Zuckungen der Augen, die bei vielen Individuen be Drehung der bulbi nach oben ausgelöst werden, zu der irrigen Annahme lassen, in allen diesen Fällen Nystagmuskranke vor sich zu sehen.

Höchst auffallend war mir indess bei meinen Untersuchungen von eini Bergwerken, dass sich die Erkankung, zwar fast nur bei Bergleuter Gattung, nämlich den Hauern, die die Kohlen aus ihren engen Lagern l und auszuhauen haben, zeigte, sich indess nur auf bestimmte Gruben de Beobachtung zustehenden Gebietes von Steinkohlenzechen beschränkte. S lag hier ein Zusammenhang mit der geographischen Lage der Bergw indem die nach Nord und Nordost von meinem Wohnorte gelegene Z Erkrankung in exquisiter Weise und zwar je weiter nach Nord um so beträ zeigten, während die nach Süd und Südwest gelegenen fast frei von der waren. So constatirte ich Z. B. auf den am weitesten nach Nord gelegene das Vorkommen von 7 per Cent aller ca. 2000 Mannschaften, während Süd gelegenen bei gleicher Anzahl kaum 0·25 per Cent des Vorkommens

Anfänglich glaubte ich hiefür vielleicht die grössere Tiefe der na gelegenen Gruben und damit die grössern Schädlichkeiten des höheren Lu für diese eigenthümliche Erscheinung des localisirten Auftretens als urs Moment ansehn zu müssen. Allein als sich weiter herausstellte, dass g jener durch den Nystagmus berüchtigten Zeche nächst gelegene und mit solidirte Grube von nahezu gleicher Tiefe fast vollständig frei von Ny kranken war, musste die Annahme des schädigenden Einflusses der einzelnen Gruben als nichtig hinfallen. Nachdem ich weiter meine Beoba zur Eruirung der Pathogenese dieses Leidens auf die Zeit des etwa zu tirenden häufigeren Auftretens gerichtet, indess keinen wesentlichen Un zwischen den einzelnen Jahreszeiten hatte constatiren können ebensowenig Art und chemische Beschaffenheit der Kohlen der einzelnen Gruben Vera

gab, in dieser das besonders schädigende Moment zu suchen, noch auch die Lage des Arbeitsfeldes, ob die Kohlen aus horizontal liegenden, oder in steilen Winkel hängenden Lagern entfernt werden müssen, wodurch natürlich stärkere Anstrengung der nach oben oder unten arbeitenden Muskelgruppen des Auges die Folge ist, ergab sich schliesslich auch meine alte Beobachtung wieder als richtig, dass die Wettereinflüsse der einzelnen Zechen von gar keiner directen Bedeutung seien. Allein der Umstand, dass sich herausstellte, dass alle diejenigen Zechen, auf denen die Bergleute der ungünstigen Luft und Wetterverhältnisse halber mit geschlossener, sogenannter Sicherheitslampe arbeiteten, die zahlreichsten Fälle dieser Erkrankung aufwiesen, während die Mannschaften der nach Süd gelegenen Gruben zumeist mit offnen Lampen arbeiteten, legte mir die Frage nach der Beleuchtungs-Qualität und Quantität des Arbeitsfeldes nahe.

Nicht die schlechten Luftverhältnisse als solche, wie sie von einigen Autoren angegeben werden, sind die schädigenden, die Entstehung der Krankheit begünstigenden Momente, sondern der Mangel der Beleuchtung, wie sie durch jene Sicherheits—(Davy'sche) Lampen gesetzt werden. Eine quantitative Lichtuntersuchung der einzelnen Beleuchtungsapparate hat mir denn auch gezeigt, dass sich nach dem Bunsen'schen Photometer gemessen das Lichtquantum der offenen Lampe zu der frisch entzündeten und zu einer acht Stunden in einer von Kohlenstaub angefüllten Luft im Gebrauch gewesenen Sicherheitslampe verhält wie 10.0 : 4-0 : 3.0, so dass also der bei der Sicherheitslampe einige Stunden arbeitende Bergmann nur ein Drittel der Lichtmenge erhält, wie der bei offener Lampe beschäftigte Arbeiter. Mein in den letzten zwei Jahren auf diesen Punkt gerichtetes Augenmerk hat denn auch ergeben, dass von den 117 in diesem Zeitraum wegen Nystagmus in Behandlung getretenen Bergleuten 107—91·4 per Cent ihre Arbeit mit Sicherheitslampen-Beleuchtung verrichten musste, während auf zwei Zechen, die nur offene Lampe führen, unter 772 Mannschaften nur 0·35 per Cent Nystagmuskranke gefunden wurden. Nicht allein die mangelnde Lichtmenge dieser Lampen, sondern auch die für die Arbeit der Hauer specielle ungünstige Construction derselben, hatte die Leute selbst bald darauf geführt, die Ursache der Entstehung ihres Leidens in die Lichtquelle zu verlegen. Dafür, dass also die Beleuchtung von wesentlichstem Einfluss für die Pathogenese des Nystagmus ist, liefern unsere Daten den stricten Beweis.

Indess nicht die mangelnde Beleuchtung des Arbeitsfeldes allein, sondern auch das mangelnde Perceptionsvermögen von Seiten der Augen ist es, was besonders die Entstehung des Nystagmus begünstigt. So ergiebt sich aus der Statistik der letzten Jahre, dass von den in specielle Behandlung getretenen Nystagmuskranken 37 per Cent resp. 39·4 per Cent an anderweitigen Augenaffectionen litten, als: Trachom, Trübung der Cornea, Iritis chronica, Irido-chorioiditis, Atrophie des Opticus, &c. &c., wodurch also ein erschwerter Gebrauch des Sehorganes bei der Arbeit bedingt war, und die ungewöhnliche dadurch nothwendige starke Anstrengung der Augen leicht zu einer Ueberanstrengung Veranlassung gab, von der die Uebermüdung die natürliche Folge war.

Weiter kommen noch als begünstigende Momente allgemeine Constitutionsanomalien hinzu, wie sie sich in fast 45 per Cent aller meiner Beobachtungen als anämische, catarrhalische, gastrische, nervöse Zustände verzeichnet finden, um das Leiden entweder indirect durch Schwächung des allgemeinen Systemes hervorzurufen oder sein Auftreten zu verstärken.

Fassen wir kurz zusammen, so lässt sich der Nystagmus der Bergleute hinstellen, als ein in dem Procentsatz 4–5 per Cent unter Kohlen-Grubenarbeitern vorkom-

mendes neuropathisches Leiden derjenigen Nervenbahnen, die die Drehung des bulbus nach oben vermitteln, denen sich in schwereren Fällen gleiche Affection der die andern Muskelgruppen des Auges versorgenden Nerven anschliessen. Der Affection liegt nicht, wie allgemein fast angenommen wird, ein Krampfzustand in den Muskelgruppen zu Grunde, sondern sie besteht in einem Schwächezustand, einer Atonie des Innervationsstromes, wodurch dieser nicht in continuitate wie gewöhnlich, sondern stossweise nach Analogie des "Tremors der Alten" in die einzelnen Nervenbahnen eintritt und dadurch nur zuckungsweise die Muskelbündel in Thätigkeit zu setzen vermag.

Wir dürfen beim Nystagmus der Bergleute also von einer verlangsamten centralen motorischen Leitung sprechen. Diese Anomalie des Innervationsreizes wird nun einmal bedingt durch die in Folge der mangelhaften Beleuchtung durch Sicherheitslampen nothwendige Ueberanstrengung resp. Uebermüdung der das Auge nach oben wendenden, im gewöhnlichen Leben an und für sich weniger benutzten, grade bei der Arbeit als Kohlenhauer indess besonders angestrengten Muskelgruppen. Begünstigt wird dann sein Auftreten durch bestehende Hindernisse des Lichteinfalles resp. der Perception desselben im Auge, und dadurch erforderte Mehranstrengung, sowie schliesslich durch allgemeine Constitutionsanomalien des Individuums, die einen Debilitätszustand des Nervensystems mit sich führen.

Hilfe zu schaffen ist bei dieser Sachlage und dem relativ hohen Procentsatz von c. 5 per Cent aller Bergleute, die an dieser höchst störenden, ja unter Umständen indirect das Leben gefährdenden Augenaffection leiden, schon aus allgemein socialen Berweggründen dringend geboten. Hilfe ist nur möglich durch Verbesserung des Beleuchtungsapparates der Bergleute. Wir wollen von dem nimmer rastenden Erfindungsgeiste des Neuzeit hoffen, dass uns bald eine neue Construction des Grubenlichtes geliefert werde, wie ja es schon in der begonnenen electrischen Erleuchtung der Gruben von Newcastle zu leuchten scheint, welches nicht nur das Leben, sondern auch das Augenlicht der schwarzen Arbeiter der Tiefe vor Schaden sichert, und damit dem Nystagmus die erste Bedingung seines Entstehens benimmt.

Resolutions as to "Tests of Sight suitable to be enforced in the case of Signallers and Look-out Men, and other persons by Land or Sea;

WITH SUGGESTIONS AS TO INTERNATIONAL ARRANGEMENTS FOR A UNIFORM SYSTEM OF MARITIME, COAST, AND HARBOUR SIGNALLING, WITH A VIEW TO THE SAFETY OF LIFE AND PROPERTY."

Followed by explanatory remarks under the several articles.

A.—With respect to Land.

(1.)—That the recommendations of the last International Medical Congress, held at Amsterdam, in 1879, are accepted by the present Congress as forming the most suitable basis upon which every Government may frame its own regulations as to its railway service. They are contained chiefly in Article XII. of the "Projet d'un règlement pour l'examen des facultés visuelles du personnel des chemins de fer," laid before and accepted by the Ophthalmological Section of the Amsterdam Congress, which is nearly as follows:—

"For admission as *Driver* or *Stoker* is required :—a healthy condition as regards habitual congestion or irritation of the eyes and eyelids; *for each eye*, complete field of vision, normal acuity and refraction, colour sense at least four-fifths of the normal, total absence of commencing cataract or any other progressive disease.

"For admission to other *Railway Service* is required :—a healthy condition as regards habitual congestion or irritation of the eyes and eyelids; *for each eye*, complete field of vision, total absence of cataract, or any other progressive disease; *for one of the eyes*, normal acuity and refraction, colour sense at least three-fifths of the normal; *for the other eye*, sight of at least half the normal, as regards both acuity and colour sense."

B.—With respect to Sea.

(2.)—That in *ocean-going ships* and in *all steamers*, especially those carrying passengers, there should always be in actual control of the helm a person possessing *with the two eyes together, without glasses*, normal sight, both as to acuity and colours; and that, *in addition*, in such ships, *at least one* of the persons actually on the look-out should be similarly qualified.

(3.)—That in vessels engaged in the coasting trade, every person liable to take charge of the helm, should possess *with the two eyes together, without glasses*, sight equal to at least two-thirds of the normal, both as to acuity and colours.

(4.)—That all persons engaged in Marine Signalling, ashore or afloat, and all Pilots, should have normal sight, both as to acuity and colours, as defined in Article 2.

(5.)—That hypermetropic persons, although satisfying the requirements of Articles 2, 3, and 4, should, nevertheless, not be admitted, if before the age of 18 they have a manifest hypermetropia of 1 dioptre or more.

(6.)—That re-examinations should be made at the age of 45.

(7.)—That the examinations should be conducted by persons of recognized competency, under the direction of a Central Medical Authority in each country.

(8.)—That an International Commission should be constituted, to fix upon such further measures as to signals as may be necessary for safe navigation, and specially upon the standard colours, and the sizes of the signals which should be employed.

EXPLANATORY REMARKS.

(The numbers refer to the Resolutions.)

A.—As to Land.

(1).—The signal services on land, though quite as important, are not so purely an International matter as those having reference to the sea. Many countries have already established legislation in this respect, and others are introducing it by degrees. It is believed that the standards now recommended may be of general utility, especially in the case of conterminous countries. The mode of examination, for colours especially, is here, as for service at sea, of the highest possible importance.

B.—As to Sea.

It is obvious that Regulations having an International character become every year more urgently required, from the increasing number, size, and speed of vessels.

In view of the practical difficulties with which all compulsory examinations are attended, it has been sought :—

(*a*.) To limit the examination in each case to what is strictly necessary.

(*b*.) To require them only when absolutely indispensable, and of the smallest possible number of persons.

(*c*.) To simplify the methods as much as possible.

On large ships, many sailors not required for the helm, or to be reponsible for the look-out, may be admitted without certificate of examination; but as it will be in the interest of all to be possessed of such a certificate, which would represent a higher competency, it may be expected that many would themselves seek for it, from whom it would not necessarily be demanded, and facilities for obtaining it should at all times be at hand in maritime ports.

(2.)—Good sight *without the aid of* glasses is required, because glasses fail to help just where clear sight is most needed—*e.g.*, in storm, rain, or fog.

Acuity of Sight:—Complete acuity is not more than sufficient, and even scarcely sufficient, having regard to the increasing number, size, and speed of steamers. But it will be practically enough, if at sea, this complete acuity is attained by the use of *both eyes combined*. The number of persons excluded under this rule will be much less than if complete acuity for *each eye separately* is exacted.

The acuity is supposed to be determined by viewing letters or signs at a certain distance, under a certain angle, on the principle of the test-types of Snellen.

Colour-Sense is supposed to be tested by pseudo-iso-chromatic tables, on the principle of those of Stilling, subject to control by the use of light transmitted through coloured glass, in imitation of signal lights. This control will also aid in detecting central scotoma for colours, in the very rare cases where it might co-exist with the required acuity.

Holmgren's excellent tests have been already extensively adopted. But their use demands more skill in the examiner. Tests well selected on the principle of Stilling might be very well adopted as standards for ascertaining normal colour-sense, as well as definite degrees of colour-sense below the normal. The principle of Stilling has been recommended as affording a quantitative as well as a rapid qualitative test.

(3.)—A lower standard is fixed in the Coasting Trade (excluding steamers) because the vessels are smaller and the speed less. Moreover, a demand for full acuity would render it difficult to procure a sufficient number of sailors, as each hand must be liable in small vessels to serve at the helm.

(4.)—It is obvious that the persons here named must have full acuity and colour-sense.

(5.)—Persons having a manifest hypermetropia above that here indicated would not possess at the age of 35 or 40, without glasses, the needful degree of acuity; it is better then, both for themselves and the service, that they should not be admitted at all.

(6.)—The attendant practical difficulties have caused one re-examination only to be advised, at the age of 45. It has been found that the very great majority of persons, once admitted as having good sight, have retained it up to that age. A great number, no doubt, have been admitted hitherto without sufficient examination. Still, it would not be practicable to institute a general examination of those already in the service. Nevertheless, it would be desirable to examine anew, in the case of Passenger Steamers, all those responsible as helmsmen and look-out men.

The Congress recommends that surgeons of ships should be qualified to exercise special surveillance as to the sight of those employed in these capacities on board.

(7.)—A central medical authority is requisite to ensure the perfection of the system, and its uniformity. He should propose the examiners, and be responsible for their fitness. They should be men of ascertained competency, and, as far as practicable, qualified as medical specialists.

(8.)—The measures recommended in Articles 2 to 7 should be brought into operation without delay. But an International Commission would still have to determine the precise colour of the glass, securing uniformity in that as well as in the size and disposition of the signal lights.

The Congress lay the greatest stress upon the appointment of this Commission in respect of Marine Signalling, as quite indispensable for the attainment of the object in view. The Commission would have to inquire into, and decide upon, many matters on which information is at present incomplete, and regarding which only a few points have been touched upon in Article 8.

Every Government, especially the Maritime Governments, should be requested to place one or more members on the Commission, such being, whenever possible, experienced naval officers or medical specialists.

It is understood that this question of an International Commission is about to be submitted to the Legislature of the United States of America, supported by a petition largely signed by scientific men of that country.

Ueber pathologische Veränderungen, welche dem Glaucom vorhergehen oder dasselbe verursachen.

Dr. Adolf Weber, Darmstadt.

In den meisten Fällen, wo wir einen Complex von Erscheinungen vor Augen haben, wie ihn ein Krankheitsprocess darbietet, wissen wir nicht, welche die Bedingungen der anderen, welche Ursache und welche Wirkung, oder *ob* es eine von ihnen ist; ob sie nicht vielmehr verbundene Wirkungen von noch zu entdeckenden Ursachen, verflochtene Resultate von noch unbekannten Gesetzen sind. Und wenn wir auch durch die uns zu Gebote stehenden Beobachtungsmethoden am Krankenbett und am Sectionstisch unter geschickter Anwendung der praktischen Regeln, welche der grosse Brite, dessen Andenken diese dankbare und stolze Vaterstadt desselben in mehreren Denkmälern ehrt, welche John Stuart Mill aufstellte, wenn wir auch mittelst dieser Regeln dahin gelangen, aus dem Chaos der Erscheinungen die einfachen Thatsachen als Antecedentien und Folgen von einander zu scheiden, so kann uns doch keine Beobachtung dazu führen, das Gesetz der Succession der Erscheinungen zu enthüllen; zu diesem Nachweis der Verursachung bedürfen wir unbedingt des Experiments.—So lange aber die Beobachtung auch diese Scheidung noch nicht vollzogen hat, sei es aus Nichtbeachtung der logischen Regeln, sei es wegen Complicirtheit des Falles, so bleibt uns nichts übrig, als vor der Hand eine geistige Scheidung der Thatsachen vorzunehmen, ausgehend von der Lehre derjenigen Wissenschaft, deren Gesetze bei der Succession der Erscheinung sich geltend machen oder geltend machen könnten. Und diese geistige Analyse ist nicht nur ein Auskunftsmittel, *faute de mieux*, sondern sie sollte stets der erste Schritt bei dieser Forschung sein, und stets wenigstens so weit geführt werden, um zu erkennen, welcher Beobachtung und welcher Experimente wir bedürfen, um auch die physikalische Scheidung vornehmen zu können.

Dass bei den Krankheitserscheinungen, deren Complex den Begriff Glaucom darstellt, die verschiedenen Antecedentien und Folgen von einander noch nicht klar unterschieden werden, zeigt die Literatur. Die Gründe warum dies noch nicht geschieht, ist für jetzt nicht meine Aufgabe zu entwickeln, mir wurde vielmehr die gestellt, diese Scheidung selbst vorzunehmen.

Dieselbe vollzieht sich am natürlichsten wenn wir die Entwickelungsbedingungen der wesentlichen Merkmale des Krankheitsprocesses auseinanderlegen.

Als das Wesen des glaukomatösen Processes wurde zuerst von Mackenzie die übernormale Spannung des Bulbus bezeichnet; Graefe erweiterte diese Definition

um den Begriff des Verlustes der Selbststeuerung des intraocularen Druc
Eigenschaft unbedingt jedem erhöhten Druck anhaften muss, wenn d
glaukomatös bezeichnet werden soll.

Nach solcher Formulirung war die Frage nach der Aufeinand
Erscheinungen zum grössten Theil eine physikalische geworden, und so k
von den Lehren der Hydrodynamik aus, im Augenblick, wo die Com
einrichtung für die Zu- und Abflüsse im menschlichen Auge bekann
unter Berücksichtigung dieser sofort ausgeschlossen werden, dass die
Gefässdruckes eine dauernde Spannungserhöhung des Bulbus hervorru
und es fixirt sich auch sehr rasch die Vorstellung, dass nur d
Abflüsse der, die Bulbuskapsel erfüllende Flüssigkeit für diese gesteigerte
verantwortlich zu machen sei. Bis heute haben sich aber die Meinu
nicht geeinigt, ob diese aus Vermehrung des Zu- oder Verminderung de
zu erklären sei, eine Differenz, welche nach der Discussion dieses Gegen
Gegenwart der Vertreter beider Anschauungen hoffentlich endlich schwi

Das zweite Merkmal des Wesens des Glaucoms, der Verlust der Selbst
machte mir die erstere Annahme, die eines vermehrten Zuflusses vom h
mischen Standpunkt aus ohne Zulassen noch anderer unbekannter
durchaus unwahrscheinlich, und konnte meines Erachtens die Erklärun
Eigenthümlichkeit nur in einer Störung der Abflussbedingungen gefund
und zwar in einer Störung, welche eine stetige Neuerzeugung solcher I
bewirke.

Gestüzt auf diese, der einschlägigen Wissenschaft entnommene
mussten für mich alle Erscheinungen geteigerter Secretion und alle pa
anatomische Thatsachen, welche das Vorhandensein hierzu geeigneter
constatirten, bei der weiteren Forschung nach dem, was dem Krankhe
vorausgeht, ausgeschlossen und in die Reihe der Folgen verwiesen we
der anderen Seite mussten alle Bedingungen gehemmter Abflüsse, all
gische Veränderungen längs des Stromweges der intraocularen Flüssigl
Kreis der Forschung, sei es durch Beobachtung, sei es durch Experim
zogen werden.

In Verfolgung dieses Weges wurde in den letzten Jahren sehr w
Material gesammelt, an welchem unseren englischen Collegen der Lö
gebührt, in den sich besonders die hier anwesenden Collegen Priestley
W. A. Brailey zu theilen haben.

Nachdem durch Versuche, meines Erachtens, jetzt hinreichend ü
dargethan ist, dass der Strom der intraocularen Flüssigkeit vom Glas
neben den Linsenrand her in die hintere Kammer, von da durch die P
vordern Kammer und im Winkel derselben nach aussen seinen Abflu
blieb bis jetzt noch unentschieden, wo die Quelle dieses Flüssigkeitsst
befinde. Die meisten Autoren sind geneigt, den ganzen Uvealtraktus
halten. Ich glaube, dass es mir geglückt ist, durch unzweideutige Ex
darzuthun, dass einzig die Gefässknäuel der Ciliarfortsätze als solche z
nen sind, und dass die ganze sogenannte intraoculare Flüssigkeit, w
Glaskörper und die Linse durchdringt und den Raum der hintern un
Kammer erfüllt, nur das von ihnen gelieferte Transsudat ist.

Injicirt man einem starken Kaninchen stündlich zwei volle Pravaz'sch
10 procentig Ferrocyankalium unter die Rückenhaut, saugt durch ein fei
welches mit einem kleinen Ballon in Verbindung steht, eine Spur Glask
um ein Regenerationsbestreben anzufachen, tödtet dann das Thier na

von sieben Stunden, bald nach Injection der letzten Dose durch Erdrosselung, während man in der Agone eine mit Essigsäure angesäuerte Eisenchloridlösung in Alcohol von mehreren Einstichspunkten aus, in das orbitale Bindgewebe injicirt, um die im Augenblick des Todes sich geltend machende Diffusion und das Entbluten der intraocularen Gefässe bei der Enucleation zu verhüten, so findet man, nachdem das Auge in derselben Eisenchloridlösung erhartet ist, Folgendes: Netzhaut vollständig ungefärbt; in der Chorioidea, deren Gefässe alle dicht mit Blutkörperchen erfüllt sind, hier und da die Perivascularräume der grossen und nur sehr sparsam der kleinen Gefässe, vorzüglich an den Theilungsstellen, blaue Niederschläge enthaltend entweder als kleine oder grössere den Gefässen aufliegende blaue Körnermassen oder dasselbe ganz einscheidend. Nirgends aber finden sich solche in den Maschen des Gewebes oder deren angrenzenden Glashäuten damit imbibirt. Auch im Perichorioidealraum war es mir nicht möglich Niederschläge aufzufinden. Die Menge dieser blauen Niederschläge nimmt nach vorn hin, gegen die Ciliarfortsätze zu und erreicht in diesen selbst ihre grösste Ausbreitung, indem die kleinsten Zweige und fast das ganze Netz der Capillargefässe mit solchen bedeckt sind. Dieser Reichthum findet sich besonders an denjenigen Ciliarknäueln, welche in der meridionalen Zone liegen, in welcher die Punktion des Glaskörpers stattgehabt hat. Und eben gerade auch in dieser Flucht constatirt man, von hinten nach vorn bis zum Petit'schen Canal an Mächtigkeit zunehmend, zu grossen oder kleinen Körnerhaufen angesammelt, dieselben Niederschläge, und zwar nur in den oberflächlichen Schichten des Glaskörpers. Bei Entnahme eines grösseren Tropfens beschränken sich diese, die Zufuhr verrathende blaue Züge allerdings nicht blos auf die, in derselben Zone liegende Gefässknäuel, sondern es betheiligen sich mit abnehmender Ergiebigkeit nach beiden Seiten hin die benachbarten Ciliarfortsätze, so dass oft ein Drittel der corona ciliaris und der, derselben anliegenden, oberflächlichen, Glaskörperschichten mit blauen Niederschlägen übersäht sind.—In der Iris unter Umständen keine Spur derselben um die Gefässe herum. Solche treten vielmehr erst wieder an der Hornhaut auf, wo nicht nur die ganze hintere Fläche derselben die zierliche blaue Zeichnung der Kittleistenfügung präsentirt, sondern innerhalb dieser, in ziemlich regelmässigem Abstand, kleine, scheibenförmige, blaue Körnerhaufen sich finden, die wie ein breiter Ring um ein helleres oder dunkleres Centrum liegen. Die Descemet'sche Haut, aber auch nur diese, von dem ganzen übrigen Hornhautgewebe, ist intensive geblaut. Gleiche diffuse Blauung, untermischt mit grösseren oder kleineren Körnerhaufen findet sich im Maschenwerk des vorderen Kammerwinkels, und zieht von hier breite, ästige, blaue Figuren nahezu quer durch die Dicke der Sclera, von welchen ich aber bis jetzt noch nicht entscheiden konnte ob sie blos mit Blau imbibirte, oder von Scleralgewebe bedeckte Züge blauer Niederschläge sind.

Ich meine, deutlicher kann das Experiment nicht sprechen: das vollständige Fehlen blauer Niederschläge auf der inneren und äusseren Netzhautoberfläche, selbst an der Durchtrittsstelle des Instrumentes durch die retina und längs des Weges desselben durch den Glaskörper; die Spärlichkeit solcher in der Chorioidea, und der Mangel jeglicher Spuren eines Uebergangs von dieser gegen die Netzhaut und Glaskörper hin; dem entgegen: der, in der oberflächlichen Schichte des Glaskörpers direkt nach der Verluststelle sich hinziehende, gegen die entsprechenden Ciliarfortsätze immer dichter werdende Strom blauer Niederschläge, und zwar gerade die Beschränkung auf diesen, ich möchte sagen, Reizbezirk; und diesem sich anschliessend die reichliche Anfüllung der Ciliarfortsätze selbst mit solchen. Ich glaube, Alles dies weisst deutlich genug auf die Ciliarfortsätze als die Quelle, und zwar die einzige Quelle, der Glaskörperflüssigkeit hin.—Weiter dürfen wir aber

noch, aus diesem Bilde schliessen, dass der Transsudatstrom im Glaskörper auf pericentrischen Wegen von der Oberfläche nach der Mitte geht. Und verbinden wir nun diese Wege mit dem, welcher noch ausserdem durch direkte Einspritzung dieses Färbmittels in den Glaskörper auch von anderen Autoren offen gelegt wurde, so ist der ganze Kreislauf dieses Höhlentranssudats hergestellt, und der histologische Aufbau des Glaskörpers in concentrischen Blättern mit einem Mittelcanal erhält hiermit eine höhere physiologische Bedeutung.

Aber auch an lebenden Thieren ist ohne weiteren operativen Eingriff der Ausgang dieses Flüssigkeitsstromes aus den Ciliarfortsätzen in den Glaskörper, und nur in den Glaskörper, mit aller Deutlichkeit zu verfolgen. Tröpfeln Sie einem Kaninchen Atropin bis zur vollständigen Erweiterung der Pupille ein, hängen dasselbe an den Hinterfüssen auf, mit je zweistündiger Unterbrechung täglich behufs Fütterung, so erscheint nach circa fünfzig Stunden die ganze Peripherie, besonders der untere Umfang derselben, bis zur ora serrata diffus getrübt, und durch diese Trübung hindurch bemerkt man grauweisse schmälere und breitere Streifen selbst Plaques, die, wie aus der Einstellung des Ophthalmoscops hervorgeht, in den oberflächlichen Schichten des Glaskörpers liegen. In der nächsten Zeit rückt die Trübung gegen den Hintergrund vor, wird dabei aber lichter und verschwindet, wenn das Thier nun freigelassen wird, in vier bis fünf Tagen vollständig. Nirgends an der übrigen Ausbreitung der Chorioidea entstehen ähnliche Erscheinungen und auch der Humor aqueus bleibt hell. Ist das Thier sehr stark und der Herzschlag kräftig, so beschleunigt man den Eintritt dieser Erscheinungen, wenn man durch Unterbindung der beiden Carotiden während des Aufgehängtseins den Arteriendruck in den entsprechenden Gefässen vorübergehend herabsetzt.— Wenn man in der Blüthe der Erscheinung die vordere Kammer punktirt, so sieht man innerhalb weniger Minuten aus der Iris, aber auch nur aus ihr, an verschiedenen Punkten des circulus iridis minor kleine graue Strömchen hervorquellen, die in der niedrigen vordern Kammer fast unverändert bleiben, wenn das Thier aufgehängt bleibt, aber in dem neu angesammelten humor aqueus in wenigen Stunden verschwinden, wenn Sie dasselbe aus seiner unnatürlichen Lage bringen.

Bedenken Sie, das trotz der Stauung in den intraocularen Gefässen durch die hängende Stellung des Thieres, und trotz des, durch die Punktion der vorderen Kammer erzeugten, negativen Druckes, keine Spur Transsudat von hinter der Iris her erlangt wird, während solches in ansehnlicher Reichlichkeit um die Ciliarfortsätze im Glaskörper angesammelt ist, und nehmen Sie hierzu aus den früheren Experimenten, dass die Niederschläge in der Vorderkammer die Blauung der Kittleisten und der Descemet'schen Membran die Anwesenheit von Ferrocyankalium im humor aqueus verrathen, dass aber die Iris, in deren Gewebe sich keine Niederschläge befinden, zu diesem Gehalt an Ferrocyankalium keinen Beitrag geliefert haben kann, so liegt, noch gestützt auf weitere, der Entwickelungsgeschichte, wie der Klinik entnommene Thatsachen der Schluss sehr nahe, dass weder Iris, noch Ciliarkörper direkt zur Constitution des humor aqueus etwas beitragen. Denn dass bei vollständigem Pupillarabschluss eine steigende Menge Flüssigkeit hinter der Iris sich ansammelt, die einzige Thatsache, welche man bis jetzt als Beweis für die direkte Betheiligung der Ciliarfortsätze an der Absonderung des Humor aqueus anführte, kann nach dem unzweifelhaften Nachweise des Durchtritts der Glaskörperflüssigkeit im perilenticulären Raum für das erstere von jetzt an nichts mehr beweisen.

Nach dem so die einzige Quelle und der ganze Weg des ciliaren Transsudats festgestellt ist, haben wir die Bedingungen seiner Fortbewegung ins Auge zu fassen. Über diese Kräfte ist so viel bekannt, dass der erste Anstoss von dem Filtrations-

druck in den absondernden Gefässen unter Beihülfe der elastischen Bulbushäute gegeben wird. Die Filtrationsvorgänge durch die Gefässwände können wir als so ziemlich festgestellt betrachten und auch für die Gefässe der Ciliarfortsätze gültig annehmen. Es handelte sich also noch um das Verhalten der zonula und des vorderen Kammerwinkels. Die von mir angestellten Versuche, die allerdings fast nur an Schweinsaugen, aber auch nur an ganz frischen, bei welchen mittelst des Ophthalmoscops noch die Details des Augenhintergrundes erkannt werden konnten, und bis jetzt nur mit einprocentiger Kochsalzlösung ausgeführt wurden, bezogen sich darnach auf den vorderen Kammerwinkel allein, indem die Filtrirnadel über demselben quer durch die cornea durchgestochen wurde; auf die Zonula allein, indem die Nadel durch den Glaskörper geführt, und die Kuppe der Hornhaut abgetragen wurde, und auf beide gleichzeitig, indem bei letzterer Anordnung die Hornhaut unverletzt blieb. Die Ergebnisse derselben sind, so weit sie den Gegenstand betreffen, in Kürze folgende: die Zonula besitzt trotz der geringen Ausbreitung die grösste Filtrirgeschwindigkeit und liefert bei normalem Augendruck von circa 25 Cts. Wasser = 18 Quecksilber, per Stunde 7 Ctgram. Filtrat; der Kammerwinkel, trotz seiner grossen Ausbreitung, liefert unter gleichen Verhältnissen im Durchschnitt nur 5 Ctgram; beide gleichzeitig unter denselben Verhältnissen nur 4 Ctgram. Weiter stellte sich heraus, dass die Zonula bis zu einem sehr hohen Druck, 100 Ctm. Wasser, eine dem Druck proportionale Filtratmengen liefert, der Kammerwinkel aber nur bei niederem Drucke eine proportionale, bei höherem, über 40 Ctm. Wasser, circa 28 Mm. Quecksilber, einem also an der Grenze des normalen Augendrucks stehenden, eine mit der Höhe des Drucks abnehmende Menge liefert, sein Filter also impermeabler wird; endlich dass beide gleichzeitig für mittlere Druckhöhen, eine mehr als proportionale Beschleunigung zeigen. Letztere Erscheinung gründet sich, wie aus dem oben angegebenen Verhalten der Zonula leicht deducirt werden kann, auf die von Runeberg für die meisten thierischen Filter gefundene Gesetzmässigkeit, dass, wenn von beiden Seiten der Filtrationsmembran ein Druck von verschiedener Stärke zur Geltung kommt, nicht der auf die Membran wirkende höhere oder niedere Druck die Permeabilität beeinflusst, sondern ausschliesslich die Druck-differenz, die zwischen der Innen- und Aussenseite der Membran herrscht. Sobald diese Differenz verringert wird, nimmt die Permeabilität der Membran zu, d. h. die Menge und auch der Gehalt des Filtrats steigt, und ist es hierbei gleichgültig, ob die verminderte Differenz durch Herabsetzen des Innen- oder Erhöhen des Aussendrucks erzeugt wird. Sobald andererseits die Differenz wieder grösser wird, sei es durch Sinken des von aussen oder Steigen des von innen wirkenden Druckes, vermindert sich die Menge und auch die Concentration des Filtrats, und zwar um so mehr als eine je grössere Differenz entsteht.

Es erhellt hieraus wie aus diesen Versuchen, dass unter sonst normalen Verhältnissen bei einer Vermehrung des Zuflusses d. h. bei einer Hypersecretion in den Glaskörperraum eine Ansammlung des Filtrats und damit eine dauernde Spannungserhöhung des Bulbus nicht zu Stande kommen kann, dass also für solche abnorme Vorgänge in dem, bei weitem rascheren Abflusse eine Compensation geliefert ist; dass dagegen eine ähnliche Compensation bei vermindertem Abflusse nicht vorhanden ist, sondern im Gegentheil in dieser Hemmung der Fortbewegung und in dem hierdurch wachsenden Druck auf die Aussenseite des Filters, vermöge der Eigenthümlichkeit der thierischen Membranen eine Quelle zur fortdauernden und steigenden Druckerhöhung eröffnet ist. Die von diesen Faktoren erzeugte Zunahme kann selbstverständlich nicht weiter gehen, als bis zum Ausgleich des Innen- und Aussendrucks und muss, wenn keine anderen Einflüsse sich geltend machen, unter

geringen Schwankungen, welche Verdunstung und Diffusion erzeugen, nahezu stabil bleiben, ebenso ersichtlich ist, dass dieser stabil gewordene Druck je nach dem Filtrationsdruck in den Gefässen auf verschiedene Höhen eingestellt sein kann. In der That finden wir auch solche Spannungszustände, vor allem beim Glaucoma simplex, welche mit geringer Schwankung durchaus unverändert bleiben und überhaupt keine andere Progredienz zeigen als solche, welche augenscheinlich nur als die Wirkung der Dauer des erhöhten intraocularen Druckes zu deuten ist.

Aber nicht bei allen Glaucomen zeigt die Drucksteigerung diesen Charakter, vielmehr documentirt sich häufig mit oder ohne zeitweilig kürzeren, zeitweilig längeren Remissionen, eine fortdauernde Steigerung bis zum Untergang des Organs. Mit wenigen Ausnahmen sind dies aber, das wollen Sie wohl beachten, Glaucome, welchen sich Erscheinungen zugesellen, die nicht zum Wesen desselben gehören und die daher auch früher als complicirende aufgeführt wurden, ich meine Erscheinungen höheren oder geringeren Grades von Entzündung. Nichtsdestoweniger ergiebt der Verfolg des Processes, dass hier keine reine Complication, sondern eine gleichförmige Folge erhöhter Druckzustände vorliegt.

Mit der Steigerung des Druckes des, aus den Gefässen filtrirten Höhlentranssudats bis zur Ausgleichung mit dem innerhalb der Gefässe herrschenden ist nämlich eine Compression derjenigen intraoculären Gefässe unabänderlich verbunden, welche nicht, gleichsam frei schwimmend, allseitig von gleichem Drucke umgeben sind, sondern eine unnachgiebige Unterlage besitzen, gegen welche sie angepresst werden können. Dies ist aber dem ganze Uvealtraktus bis zur Basis des Ciliarmuskels, und in diesem, dass fällt schwer ins Gewicht, zugleich die Blutabflüsse für die frei schwimmenden Theile, die Iris und, je nach dem Bau des Auges die Ciliarfortsätze in grösserer oder geringerer Breite, also, wie nachgewiesen, die Abflusswege der allein das Höhlentranssudat liefernden Gefässpartieen. Die Stärke der Verengerung dieser Abflusswege muss proportional dem Drucke des Höhlentranssudats auf- und niederschwanken und alle Erscheinungen einer passiven Hyperämie von der geringsten Einengung bis zur vollständigsten Absperrung der venösen Rückflüsse im Gefolge haben. Und so bestätigt es auch die klinische Beobachtung in den verchiedenen Charakteren des sogenannten entzündlichen Glaucoms. Dass aber diese Erscheinungen nicht der Ausdruck aktiv entzündlicher Vorgänge, oder der Ausdruck jenes Processes sind, welchen wir nach dem jetzigen Brauche der Wissenschaft überhaupt erst entzündlich nennen, das hätte man, ausser anderen Kennzeichen, aus den Eigenschaften des Transsudats entnehmen können. Das Stauungstranssudat unterscheidet sich bekanntlich von dem entzündlichen Extravasat, ausser durch seinen geringen Gehalt an weissen Blutkörperchen, und besonders deren relativen Sparsamkeit gegenüber den rothen, hauptsächlich, und darin sogar von der normalen Lymphe, durch seinen geringen Eiweissgehalt und das Unvermögen zu gerinnen, wenn auch Salze und Extraktivstoffe ungefähr gleich sind. Diese Beschaffenheit wird aber durch den Mangel plasticher Vorgänge im Verlauf des sogenannten entzündlichen Glaucoms von der klinischen Beobachtung und, nach der Deutung, welche ich den neueren Befunden von Brailey geben zu müssen glaube, auch von der pathologisch-anatomischen bestätigt; zudem ist es in die Hand des Experiments gegeben, und von mir in letzter Zeit angestrebt worden, die chemischen Eigenschaften des Transsudats aus den verschiedenen Stadien des entzündlichen Glaucoms festzustellen.

Wie weit wird nun der, durch diese Rückwirkung des gespannten Höhlentranssudats auf die absondernden Gefässe hinaufgetriebene Filtrationsdruck steigen können? Selbstverständlich nur bis zur Höhe des Blutdrucks in den

Zweigen der art. ophthalmica, über welche hinaus eine Spannungsvermehrung des Bulbus nicht denkbar ist, indessen wegen der Folgen venöser Stauung auch nicht erreicht wird.

Soweit über die Reihenfolge der Bedingungen zur Entwickelung abnormer Drucksteigerung; es erübrigt noch ein rascher Blick über die Reihenfolge der Bedingungen zur Entwickelung des anderen Merkmals des Wesens des Glaucoms.

Es ist durchs Experiment nachgewiesen, wie dies fast ohne solches verständlich ist, dass ein erhöhter Druck im Glaskörperraum, nicht blos auf die von den unnachgiebigen, bis zu ihrer Elasticitätsgrenze ausgenützten, Scleralwände gestützten Theil des Uvealtraktus wirkt, sondern dass die beweglichen Theile desselben, Iris und Ciliarfortsätze, soweit sie über die Basis des Ciliarmuskels hervorragen, in entsprechendem Grade von diesem Druck betroffen werden, und dies in entsprechender Weise durch excentrische Verlagerung beantworten. Dadurch aber, dass gleichzeitig der Ciliarmuskel in seiner Conformation und Ernährung auch die Consequenzen dieses Druckes trägt, und zu einer flachen Schicht spärlicher Muskelfasern wird, begünstigen beide Momente die Annäherung der Implantationsstelle der Iris an die Basis der Cornea. Mit der Einengung und dem endlichen Verschlusse dieser Stelle ist aber der verhängnissvolle Schritt geschehen, welcher dem Wesen des Glaucoms sein zweites Merkmal, den Verlust der Selbststeuerung zuzieht: die letzten Abflusswege des intraocularen Höhlentranssudats sind verschlossen, und hiermit jede Aussicht auf eine Reparation normaler Druckzustände abgeschnitten, selbst für den Fall, dass die initialen Filtrationswiderstände durchbrochen würden.

In dieser Darlegung, welche die Reihenfolge der Bedingungen für die Entwicklung der beiden Merkmale des Glaucoms enthält, sind Antecedentien und Folgen scharf von einander geschieden, und auch die Scheidung der verschiedenen Antecedentien untereinander mit ihren zugehörigen Folgen ebenso scharf markirt.

Wenn dieselbe, um alle Fälle zu umfassen, von der allgemeinen Annahme eines Widerstandes in der Filtration des intraocularen Höhlentranssudats ausging, so berücksichtigte sie selbstverständlich die Oertlichkeit der Störung nicht, da der Verlauf des Processes, nur mit Variationen im Bilde, stets der gleiche bleibt, an welcher Stelle des Stromwegs auch der Abfluss des Filtrats beengt wird.

Es sprechen klinische wie pathologisch-anatomische Thatsachen dafür, dass schon im Glaskörper selbst solche Widerstände sich bilden können; es sprechen klinische wie pathologisch-anatomische Thatsachen dafür, dass eben solche im perilentikulären Filtrationskreis der Zonula sich etabliren können; es ist bekannt, dass beim Durchtritt durch die Pupille solche Hemmnisse entstehen; es ist gleich zweifellos, dass vor dem Eingang zum Schlemm'schen Canal solches statt haben kann; es ist sehr wahrscheinlich, dass der Eingang selbst und das Innere des Canals in Folge gewisser Altersveränderungen verschlossen werden können; es ist weiter wahrscheinlich, dass noch an der Scleraloberfläche die Ausflüsse verhindert werden können; es ist mehr als wahrscheinlich, dass ein höherer Eiweissgehalt, besonders eine Beimischung von Eiweiss zum Humor aqueus, z. B. unter Umständen, wie sie vor einigen Tagen Professor Grünhagen angedeutet hat, solche Hemmnisse bereiten können. Alle pathologischen Processe und Steigerung normaler Bildungsvorgänge, und die Senescenz ist wohl als solche aufzufassen, welche diese Hemmnisse produciren, haben wir den Antecedentien des Glaucoms einzureihen. Und wenn wir den allen Fällen gemeinsamen und unter allen Umständen wirkenden Vorgang als die Ursache, als das unveränderliche und unbedingte Antecedens des glaukomatösen Processes bezeich-

nen wollen, so kann diese Bezeichnung nur der fortschreitenden Einengung der Abflusswege des intraocularen Höhlentranssudats beigelegt werden.

Die bis jetzt bekannten, pathologischen Veränderungen, welche die Einengung der Abflusswege bedingen, sind für die Art des Glaucoms, welche man als secundäre bezeichnet, so reichlich, dass ich der Kürze der mir zugemessenen Zeit wegen die Aufzählung unterlassen muss; für das primäre Glaucom dagegen, wo wir mit unsern Beobachtungsmitteln in Mitten der Folgeerscheinungen gesetzt sind, belaufen sich unsere sicheren Kenntnisse, d.h., so weit die Thatsachen der Beobachtung mit den Ergebnissen des Experiments übereinstimmen, bis jetzt nur auf solche pathologische Veränderungen welche einen mechanischen Verschluss des Vorderkammerwinkels erzeugen, einen Verschluss durch die Anlagerung der Iris; und selbst hierbei herrscht in der Deutung, ob dieser Verschluss der Ausgangspunkt für die Entwickelung der Drucksteigerung, oder nur die im Gefolge derselben erzeugte Ursache des Verlustes der Selbststeuerung, oder beides sei, noch eine Differenz der Meinungen. Es herrschen weiter noch getheilte Meinungen, ob im ersten Falle der Verschluss durch vorgängig entzündliche Zustände der Nachbargegend, vor allen des Ciliarkörpers, oder durch eine mechanische Einwirkung der hinter der Iris gelegenen Theile, d. h. durch Anschwellung und Vorrücken der Ciliarfortsätze hervorgebracht wird. Indem ich der letzteren der drei Meinungen huldige, d. h. für die grösste Anzahl der Fälle von primären Glaucom den Verschluss dieses Filtrationswinkels nicht nur als die Ursache der Drucksteigerung sondern auch die des Verlustes der Selbststeuerung ansehe, so erlaube ich mir, daran zu erinnern, dass, wenn ich auch selbst für einige Formen von secundärem Glaucom die entzündliche Entstehung urgirt habe, ich doch betreffs des Modus des Verschlusses der Vertreter der Ansicht bin, dass derselbe im typischen Glaucoma simplex auf rein mechanischem Wege, durch eine mehr oder weniger lang vorbereitete Anschwellung und Vorrücken der Ciliarfortsätze zu Stande kommt. Es musste also mein fortgesetztes Bemühen sein, und ist es noch jetzt, diese Möglichkeit experimentell nachzuweisen, da die Beobachtungsmethoden nur sehr zweifelhafte Antwort geben können: die klinische, weil sie sich ziemlich über das ganze Leben des Patienten und über eine unabsehbare Zahl von solchen ausdehnen müsste; die anatomische, weil sie hier das Antecedens von dem Consequenz nicht zu unterscheiden vermag, wenn sie ihre Thatsachen nicht einer fortlaufenden Reihe von Untersuchungen der einzelnen Stadien, bis zum initialen hinauf entnimmt, sondern, ihr Beobachtungsmaterial, wie es bis jetzt der Fall war und auch zukünftig sein wird, nur denjenigen entnimmt, wo die Anschwellung der Ciliarfortsätze längst dem Schicksal anheimgefallen sein kann, dem jede andauernde Venenstauung, die nicht gelöst wird, verfällt: der Atrophie der ganzen zugehörigen Gewebspartie.

Leider sind die Ergebnisse meiner Versuche erst bis zur Wahrscheinlichkeit gelangt. Aber so weit will ich sie Ihnen nicht vorenthalten.

Nach Irschick erfährt der Seitendruck in der Vena jugularis durch Abwärtshängen des Kopfes eine Steigerung um das Dreifache, und dem entsprechend in den weiter peripherisch gelegenen Aesten derselben eine noch ansehnlichere, beispielsweise beim Hunde eine solche von 45 Mm. Normaldruck bis auf 128 Mm.

Dieses Mittels bediente ich mich, um bei Kaninchen eine dauernde Erhöhung des Venendrucks und dadurch allmälige Erweiterung der Gefässe zu erzielen. Ich hängte die Thiere verschieden lange Zeit an den Hinterfüssen auf. Die sofortige Wirkung dieser Procedur ist ein starker Exophthalmus und exorbitante Spannung des Bulbus, die, wie leicht festzustellen, zum grössten Theil unabhängig von dem

von der orbita auswirkenden Drucke ist. Die vordere Kammer wird niedriger, die äusseren Ciliarvenen erweitern sich. Nach circa dreissig Stunden bemerkt man, ausser einem ansehnlichen Oedem der conjunctiva, schon einen deutlichen Unterschied in der Breite der Centralarterien während der hängenden und natürlichen Stellung; in ersterer Arterien eng, selbst bis zum Verschwinden kleiner Papillaräste, in letzterer, weiter als selbst vor Beginn des Versuches; ausserdem nach längerer Befreiung aus hängender Stellung eine Trübung und ein deutliches Verwaschensein des Gewebes der Papille, als ob sie serös durchtränkt sei. Nach circa fünfzig Stunden gesellt sich, besonders wenn vorher Atropin angewandt wurde, eine wolkige Trübung untermischt mit grauweissen Streifen in der äussersten Peripherie des ophthalmoscopischen Gesichtfeldes hinzu. Nach achtzig Stunden haben alle diese Erscheinungen eine bedeutende Zunahme erfahren und es ist jetzt deutlich durch Gläser zu constatiren, dass während des aufgehängten Zustandes eine Vertiefung des Papillargrundes, gleichzeitig mit Abnahme des verticalen Durchmessers derselben stattgefunden hat. Bei der Section constatirt man, wenn die Enucleation mit allen Cautelen vor Entbluten der intraocularen Gefässe vorgenommen wurde, eine nicht zu verkennende, selbst variköse Erweiterung der strotzend mit Blut gefüllten Ciliargefässe; ausserdem einen hyperämischen Zustand der Papille und des aufliegenden Stücks der Opticusscheide. Weiter konnten diese Versuche, der Thiere wegen, noch nicht fortgeführt werden. Bedenkt man aber eine wie verschwindend kurze Zeit es ist, während der dieser erhöhte Venendruck erhalten werden konnte, gegenüber derjenigen, welche sich nicht compensirte Klappenfehler, Dilatation des Herzens, Pericardialaffectionen, Emphysem etc., oder welche die verschiedenen Beschäftigungen, die mit einer zeitweisen Hemmung des venösen Rückflusses verbunden sind, der Zeit, welche alle diese Einwirkungen sich nehmen, um einen dauernd erhöhten Venendruck mit Ausdehnung der Gefässe zu erzeugen, so wird man dem einstweiligen Resultate meiner Versuche immerhin einige Wahrscheinlichkeit zur Erzeugung glaukomatöser Zustände vermittelst erhöhten Venendruckes zugestehen.

Trotzdem bin ich weit entfernt, diesen Modus des Verschlusses als den allein vorkommenden aufstellen zu wollen. Die klinische Beobachtung sagt uns, und die soeben gegebene Darlegung der Bedingungen zur Entwickelung des Glaucoms bestätigt es, dass noch andere Verschlussarten hier und weitere auch an den übrigen Durchgangspforten vorkommen können. Es kann nicht befremden und wird die Richtigkeit des einmal Nachgewiesenen nicht umstossen, nur beschränken, wenn die fortschreitende Forschung weitere Hemmnisse für die Fortbewegung des Transsudationsstroms enthüllt; nur müssen wir, wenn wir sie den Ursachen einreihen sollen, selbstverständlich verlangen, dass sie nicht blos durch die Beobachtungsmethoden, ob klinische oder pathologisch-anatomische, sondern gerade in dieser ihrer Eigenschaft als Ursachen experimentell nachgewiesen seien. Denn bei aller Anerkennung des Werthes der Induktion im medicinischen Denken, muss es doch bei einigem Nachdenken in die Augen springen, dass sie uns betreffs des Causalitätsverhältnisses in complicirten Fällen ohne die vom Experimente gestützte Deduktion im Stiche lässt.

Professor Laqueur, Strasbourg, made a communication upon an increase in the refraction of the eye which he had observed in twelve cases of iridectomy for glaucoma. The increase varied from 0·75 D. to 4 D., being least in the premonitory stage, and in glaucoma simplex, and most marked in acute glaucoma. It was most

probably due to a change in the curvature of the front of the lens, and thus pointed to the presence of pathological changes in or near the zonula Zinnii. Such changes might explain the existence of a predisposition to glaucoma in cases where there was no obliteration of Fontana's canal. They could not, however, explain the onset of an acute glaucoma for which, depending as it does upon deranged compensation of fluid, other causes must be sought.

The Pathology of Glaucoma.

Mr. Priestley Smith, Birmingham.

Much new light has been thrown on the pathology of glaucoma during the last few years. Professor Leber has shown that the intra-ocular fluid escapes from the eye, chiefly, if not entirely, at the angle of the anterior chamber. Dr. Adolph Weber and Dr. Max Knies have drawn attention to the fact that, in the large majority of specimens of glaucoma, primary as well as secondary, the angle of the anterior chamber is closed. It is no longer possible, I think, to doubt that this closure of the chief outlet of the eye has an intimate connection with the causation of glaucoma. The question which we have now chiefly to discuss is the manner in which the closure is brought about.

Two years ago I put forward a definite theory with regard to the origin of primary glaucoma. Further observations made since that time, and especially within the last few months, have strengthened the position of that theory; I therefore now venture to ask your attention to it again.

In the healthy eye, a stream of fluid is constantly passing from the vitreous chamber to the aqueous chamber through the circumlental space—the space which separates the margin of the lens from the ciliary processes. With the advance of life the circumlental spaces become narrower, in consequence of the increasing size of the lens. Even in the senile eye, however, a space remains which is sufficient for the passage of the intra-ocular fluid. But if this space be still further encroached upon, either by the lens on the one hand, or by the ciliary processes on the other, a serious obstruction is set up. The escape of fluid from the vitreous chamber is retarded; the vitreous chamber becomes over-filled; the lens and its suspensory ligament advance, pushing the ciliary processes against the periphery of the iris; the periphery of the iris applies itself to the posterior surface of the cornea, the angle of the anterior chamber is closed, and glaucoma is established. Then, as the pressure rises, a passive hyperæmia is set up in a manner which has been explained, completely, as I think, by Dr. Adolph Weber in his work, "Die Ursache des Glaucoms." The swelling of the processes intensifies the glaucomatous condition, by causing a still firmer occlusion of the angle of the anterior chamber.

That, very briefly stated, is the theory by which I have sought to explain the occurrence of primary glaucoma. I will now indicate as briefly the evidence on which it rests.

Certain experiments—a detailed account of which I have already published—revealed the fact that if we artificially raise the vitreous pressure slightly above the aqueous pressure, the lens and suspensory ligament immediately advance, and the angle of the anterior chamber immediately becomes closed, by the pressure of the ciliary processes against the iris, in a manner which closely simulates the con-

ditions which are present in primary glaucoma. This result gave an important clue. It appeared to indicate that the starting-point of primary glaucoma is some change which tends to overfill the vitreous chamber as compared with the aqueous chamber. It appeared reasonable to look for this change at the outlet of the vitreous chamber—the circumlental space.

Now, as to the size of the lens at different periods of life. At the meeting of the British Medical Association held last year at Cambridge, I exhibited specimens which shewed a progressive increase in the volume of the lens with the advance of life. The increase affected both the diameter and the thickness. These specimens were from the eyes of five individuals only, and it was properly objected that the series was too small to establish a general rule. Professor Donders, who was present on that occasion, suggested that it would be well to weigh a series of lenses, inasmuch as the weight of a small solid body is ascertainable with much greater accuracy than its linear dimensions. I have proceeded in this manner. I have accurately weighed a series of lenses and I have made a direct measurement of the volume of each, by means of an apparatus specially designed for the purpose. The principle of the apparatus is this: the lens is introduced into a glass bulb containing a coloured fluid, and causes a displacement of the fluid along a graduated glass tube; the amount of the displacement indicates the volume of the lens. The accuracy of the instrument has been rigidly tested, with the help of Professor Poynting, the Professor of Physics in the Mason Science College in Birmingham. The average error was half a cubic millimetre, the maximum error about one and a half cubic millimetres; seeing that the volume of the lens varies from 140 to 240 cubic millimetres, errors of the amount mentioned are of no practical importance. I have examined in this manner forty-five lenses from thirty individuals. Only such as were perfectly transparent, and had an unruptured capsule were employed. From the tables which exhibit the results,* it is apparent at a glance that, both as regards weight and volume, the lens undergoes a very considerable progressive increase with the advance of life. Thus, at thirty years of age, the average lens has a volume of about 160 cubic millimetres; at sixty years of age, of about 210 cubic millimetres. So far as my observations go at present, it appears that volume and weight increase in nearly equal proportion, and hence, that the specific gravity remains nearly the same at different ages.

This fact concerning the increasing volume of the lens will be found, I believe, to have a practical interest in several directions—for example, in connection with the development of cataract, which condition I have found in two instances to be associated with a marked deficiency in volume as compared with the healthy lens; and in connection with the shallowness of the anterior chamber proper to the senile eye, which appears to be owing to increase in thickness, and not to displacement of the lens. It certainly possesses a physiological interest. But of these points this is not the time to speak; my present point is the bearing of the fact upon the causation of glaucoma.

Glaucoma is pre-eminently a disease of advanced life. A large majority of the cases met with are in persons of more than fifty years of age; and when we remember that persons of this age are much less numerous than those representing the earlier periods of life, this characteristic of the disease becomes still more prominent. I venture to maintain that the special liability to glaucoma which characterizes the senile eye depends upon the large size of the senile lens.

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* The Tables were displayed during the meeting.

The chief predisposing cause of primary glaucoma is, in my opinion, an insufficiency of space between the margin of the lens and the ciliary processes. The crucial question is this:—When we dissect specimens of primary glaucoma, do we find the circumlental space narrowed or abolished, as we ought to do if this theory is correct? In many specimens, on the contrary, we find it even wider than in the healthy eye; but this is because such eyes come into our hands only when the disease has already reached an advanced stage—a stage in which atrophy of the ciliary muscle, a change to which Dr. Brailey has called attention, and which he has most accurately investigated, is extreme, and when the ciliary processes, also, are shrunken and retracted. These structures, in undergoing atrophy, retract from the margin of the lens, and re-open widely the circumlental space; there is frequently, however, an impression in the periphery of the iris which indicates that they have previously occupied a much more advanced position. It is only in specimens of recent primary glaucoma, and in such as are examined with special precaution as to non-disturbance of parts, that we must expect to find the initial change, the closure of the circumlental space, still existent. In two such specimens I have found the margin of the lens in close and firm contact with the ciliary processes, and the latter pressed thereby against the periphery of the iris.

It may be objected that two instances alone have but little value; but I would point out that their value is greater than that of mere isolated observations, inasmuch as they are in complete accordance with an inference previously arrived at by experiment and induction.

With regard to glaucoma as a whole, the position which I desire to maintain may be expressed in general terms as follows:—Glaucoma of every form is essentially a disease of retarded excretion; active hyperæmia and hypersecretion are to be regarded as exciting and auxiliary causes; they act by causing a rapid development of the obstructive changes. The obstruction is different in various forms of the disease: its situation is usually such as to conceal it from inspection in the living eye, but the visible changes which it induces frequently suffice to reveal its position. Thus, when, as in primary glaucoma, the lens and iris are driven towards the cornea, we must conclude that the surplus fluid is in the vitreous chamber, and seek the obstructive change in the circumlental space. When the iris alone is driven forward by fluid imprisoned in the posterior aqueous chamber, as in cases of annular posterior synechia, we find the impediment at the margin of the pupil. In both these cases the displacement of the iris leads to a closure of the angle of the anterior chamber, which locks up the whole eyeball so far as concerns the circulation of the intra-ocular fluid. When, on the other hand, as in the case of serous iritis, the surplus fluid collects in the anterior chamber, and displaces the iris and lens backwards, then the initial obstruction must lie in the outlet of the anterior chamber itself, and must be sought in the neighbourhood of the ligamentum pectinatum and Schlemm's canal.

On the Etiology of Glaucoma.

Dr. Angelucci, Rome.

The canal of Fontana is not a path of lymphatic filtration. I find that, embryologically, it is developed by the penetration of fluid from the aqueous chamber into

the tissues which surround it; in the adult it is the most posterior part of the aqueous chamber. Descemet's membrane takes no active part in the formation of the meshwork of the canal of Fontana, since it is nothing else than a basal production of the endothelium lining the posterior corneal surface. The opinion held by some, that the canal of Schlemm is a lymphatic channel which communicates by an open mouth with the canal of Fontana—that is to say, with the aqueous chamber—is quite wrong. For the canal of Schlemm is composed of a plexus of veins, which have their own uninterrupted walls.

It is consistent with these facts that, by exosmosis, an escape of fluid may take place from the anterior chamber into Schlemm's canal, but there can never be an open communication between them. I grant that obstruction at the spaces of Fontana may cause a latent glaucoma to appear and may aggravate its symptoms, but I deny that this is the primary condition, and that it is the *conditio sine quâ non* for the development of glaucoma.

Besides, microscopy shows that the occlusion of the canal of Fontana is not a primary change. This is not obliterated by an active inflammation of the tissues which surround the canal of Schlemm, because the canal of Fontana shows microscopically all the appearance of an atrophic tissue, the result of continual compression. Where, then, must we seek the causes of this compression?

The condition of the bloodvessels explains everything. On the one hand, the arteries become sclerosed, and on the other, some of the veins dilate while others become obliterated by phlebitis and peri-phlebitis.

The arteries, when sclerosed, have their calibre diminished; and not only that, but the length of the blood-wave is also diminished. Thence results a venous stasis from a dimished systolic impulse, and also a failure of nutrition in the tissues supplied. Besides that, there is atrophy and obliteration of the lymphatic channels, which in the eye attains an extremely high degree, since, as a result of vasculitis and peri-vasculitis, the lymphatic spaces traversed by the bloodvessels of the iris and choroid are obliterated.

Venous stases are compensated by an increased secretion of lymph, but in glaucoma the lymph, finding no means of exit, because the ways of filtration are closed, causes that augmentation of the intra-ocular contents by which glaucoma is produced.

The disease of the bloodvessels, which is developed in the eye in these cases, is a chronic process which is essentially progressive. Nevertheless, its rate of increase may be irregular, or it may even remain stationary. On these points depend the course and the varied forms of glaucoma.

DISCUSSION.

Dr. de Wecker, Paris: It is hardly possible for me to criticize Dr. Weber's communication, as I have not been able fully to follow it. M. Ulrich was the first to carry out experiments with coloured intra-ocular injections. From these it appears that the nutritive current does not pass between the lens and the posterior surface of the iris, but through the latter membrane, at its base, so as to reach the peri-corneal filtration zone. I think that the very interesting observations of Mr. Priestley Smith would be still more valuable if they could be put on a physiological basis—*i.e.*, if it could be ascertained by accurate measurements whether the variations in the size of the lens were or were not compensated for by corresponding natural variations in the diameter of the cornea.

Dr. Osio, Madrid, narrated a case of dislocation of the lens which occurred after several days' use of eserine. The case was one of glaucoma secondary to adherent leucoma, in which iridectomy had been performed with good result before the use of eserine. The counter-puncture was made in the leucoma itself, and this, he thought, should be avoided, as likely to set up prolonged ciliary mischief, from the dragging of iris which it may cause.

Professor Leber, Göttingen: I wish to call your attention first to experiments upon animals on the source of the secretion of the intra-ocular fluids, which have been made, on my proposition, by Dr. Deutschmann, and the results of which are published in the *Archives of Ophthalmology*. It is possible to remove in rabbits the whole iris, together with the ciliary processes, at one time; and if this operation is done with the necessary precautions, it is followed by no inflammation, especially by no exudation into the interior of the eye. Very soon afterwards the eyes become soft; not only the aqueous humour is not renewed at all, but even the vitreous humour disappears entirely. These experiments support the conclusion which Dr. Adolph Weber has derived from his own experiments, that the secretion of the vitreous humour depends on the ciliary processes and the iris; but they do not confirm his opinion, if I understand him correctly, that the aqueous humour is not secreted by these organs. On the contrary, we have come to the conclusion that the secretion of all intra-ocular fluids ought to be attributed to the ciliary processes and the iris. I have made a filtration experiment on two excised human eyes with primary inflammatory glaucoma, which is in favour of the view that there is some obstruction to the outflow of the humours from the interior of the eye. If you connect a manometer with the anterior chamber in a normal eye, after death, the fluid goes out of the eye very rapidly, so that the column of mercury is continually falling. On the contrary, in the two glaucomatous eyes examined, the falling of the mercury was very slow, so that an obstacle to the filtration must have been present. As to the theory of Mr. Priestley Smith, and the very interesting anatomical and experimental researches he has published, I wish to hint at two facts which seem to me to offer some difficulty in respect to them. As he made his injections into the vitreous body of dead eyes, I had the intention to repeat these experiments on living animals. True, the number of the experiments I have made is very limited, but in these I did not succeed in producing a constant increase of the intra-ocular pressure by injection of indifferent fluids into the vitreous humour. The second fact is a clinical one; cases have been observed where glaucoma occurred in eyes in which the lens had been removed. This seems to be difficult to explain by the theory of Mr. Priestley Smith; but such cases are rare, and glaucoma may come on in different ways.

Mr. G. E. Walker, Liverpool: The method of production of glaucoma put forward by Mr. Priestley Smith, occurs probably only in cases of rapid swelling of the lens from injury, as after needling of congenital cataract. In glaucoma, the iris is not merely applied to the cornea, but is closely united to it by adhesive inflammation. There is a want of evidence to show that there is any considerable flow of fluid from the vitreous to the aqueous chamber. In cases of loss of vitreous, or even wound of it, the very long time which elapses before the vitreous even approximates to its normal condition, is very much against the idea that the vitreous is anything but a comparatively passive body. The theory of the production of glaucoma which I advocate, is that the continual teasing of the ciliary body, through the over-action of the ciliary muscle, in hyper-

metropic eyes, leads to inflammation of the ciliary body, and retention of fluid in the eye through the blockage of the lymph-spaces in the ligamentum pectinatum.

Dr. Brailey, London: It will be very interesting if it should be confirmed that the lens gradually increased in size through life, even after the growth of the rest of the eye had ceased. But for this to have any bearing upon glaucoma, it must also be shown that the lens in glaucomatous eyes is on the average larger than in other conditions. My own measurements, made in large numbers of eyes excised on account of incurable glaucoma, point to the reverse conclusion. But perhaps the lens had been in these cases larger at the outbreak of the disease, and had afterwards shrunk. This explanation, however, is difficult to accept in cases where the lens remains clear. The theory of Priestley Smith fails to account for temporary glaucoma, for glaucoma without characteristic application of the iris, for glaucoma in young persons, for one-sided glaucoma, for glaucoma in aphakic eyes, and especially for cases where a traumatic dislocation of the lens backward has been quickly followed by increased tension. It also does not explain the invariable inflammation and atrophy of ciliary body and optic nerve. Lenses taken from the cadaver are not so trustworthy for measurements as others, nor is the mode of preparing them free from objection. Often, after the removal of a clear lens from a glaucomatous eye, I have seen its diameter become very considerably less. This, which perhaps was the cause of the phenomenon observed by Dr. Laqueur, appears due to previous excessive tension of the zonula.

Dr. Galezowski, Paris: I can only accept Mr. Priestley Smith's theory for certain cases. There are other cases of glaucoma which cannot be explained, either by an increase in the size of the lens, or by narrowing or obliteration of the filtration exits. There is another cause of glaucoma to be found in the influence which the secretory nerves of the eye exert, as Donders has shown, upon the quantity of liquid secreted. In support of the last named theory, that defective innervation of these nerves might cause glaucoma without predisposing conditions, I may cite a case in which glaucoma with cupping of the disc came on as the result of using atropine for fifteen days after the ablation of a pellucid staphyloma of the cornea. The glaucoma was stayed by iridectomy. In several other cases I have seen glaucoma come on in eyes which had not previously shown the slightest glaucomatous symptoms.

Dr. Weber, Darmstadt: Swelling of the ciliary folds is certainly not the only mode of hindrance to the outflow of the intra-ocular fluid. For impediments could be set up in the vitreous itself, in the zonula, or in the course of the fluid through the pupil before entrance into Schlemm's canal, in the canal itself, and finally, in the superficial layers of the sclera. Indeed, a higher albuminosity of the intra-ocular fluid may produce an impediment in the outflow.

Extraction of Cataract by Peripheral Division of the Capsule.

Dr. H. Knapp, New York.

Mr. President and Gentlemen,—I have tested this mode of extraction in about 175 successive cases. The first 166, complicated as well as uncomplicated, will form the basis of my remarks, as the others were operated on too short a time

before my leaving New York to have their acuteness of vision tested. They were, however, all successful.

The method of operating was essentially that of Von Graefe—puncture and counter-puncture, 1 mm., in the sclero-corneal junction, at the meeting of the middle and upper thirds of the cornea, apex of section commonly close below the upper transparent corneal margin. The iridectomy was extensive. When by gentle pressure with the fixing forceps the section was made to gape, a very sharp, angular, or sickle-shaped needle (the instrument was shown) was passed horizontally through that part of the capsule, which presented in the wound. In large cataracts with a tough capsule, a small vertical division, joining the horizontal in its middle, was added. The lens was expelled with a hard-rubber spoon, applied to the lowest part of the cornea, and pressed directly toward the centre of the globe. Remnants of cortex, if left, were forced out, with the eyelids, after the removal of the speculum. Particular care was taken to free the wound from portions of iris, capsule and lens, and also from clots of blood. Cleanliness was scrupulously observed, but no special antiseptic substance used. Anæsthesia only in timid or uncontrollable patients—scarcely in one out of ten. The closed eyelids were padded with picked linen, held in position by a flannel roller—the old binoculus. In the majority of cases the eye was inspected the second day, often for the sake of clinical instruction, a practice which I do not recommend, and have abandoned, as it violates one of the most important, perhaps the most important, condition of obtaining primary union—immobility. Atropia was instilled a day, or several hours before—not immediately after the operation.

Among the incidents to which this mode of operating is liable, I need speak of one only—prolapse of vitreous—the others being neither more nor less common than in the merely central, or the combined central and peripheral opening of the capsule. In the last but one hundred cases prolapse of vitreous occurred in ten, in the last hundred in six cases. This is not a very high number; yet I hasten to say that of the six cases in which escape of vitreous after peripheral opening of the capsule occurred, four were complicated cataracts, where the zonula was either frail or defective, and the vitreous fluid. When the capsule is really cut, and not torn open, prolapse of vitreous in this method is as rare as in any other. A traction instrument to get the lens out was used only twice, at the beginning of my practising this method; in the last hundred cases no instrument was introduced, either for the removal of the entire lens, or of remnants of cortex.

The mode of healing is distinguished by a greater rarity of iritis, capsulitis, cyclitis and hyalitis than in any other method that I am acquainted with. In many cases—I have not noted the exact proportion, but I think it was more than 50 per cent.—the capsular wound healed by first intention—that is, when examined, on the second, third, or fourth day, the capsule was found united, a white streak running horizontally across the upper part of the coloboma indicating the capsular section. The iris was clear in front of the capsule, lustrous, and free from congestion; the pupil dilated ad maximum. The capsule was evenly spread across the pupillary field, and if remnants of cortex were left—which at the periphery was not uncommon—they were shut up in the capsule without causing any reaction. In a considerable minority of the cases this condition was not observed. The horizontal capsular scar had offsets, rarely in its centre, but mostly at one of its ends, running straight or obliquely a short distance down the anterior capsule. In such cases filiform synechiæ were sometimes noticed, which, with only one exception, tied the iris to a shred of capsule, or to the capsular scar.

In these cases the capsular opening did not close, though the recovery was mostly without notable irritation. In some cases the lips of the wound remained separated from each other, but they were united to the posterior capsule, which lay bare in an elliptical space. In others, portions of the posterior (upper) lip of the capsular wound were united to the corneal scar; in others, again, the posterior lip had retracted toward the ciliary body, while portions, and in exceptional cases even the whole extent, of the anterior (lower) lip were united to the corneal scar. It was almost exclusively in such cases that I saw any reaction take place, with products of plastic inflammation in the upper part of the coloboma. It always originated in, and mostly was confined to, the places where the iris touched the wound in the capsule. Near the corners of the corneal section the reactive processes were most frequent and most intense, which is easily understood when we consider that there the three wounded parts—cornea, iris, and capsule, come in closest contact, and apart from any inflammatory irritation, easily unite, according to the general law that raw surfaces will agglutinate wherever they come in contact. The parts at the corners of the wound suffer more than the others from the passage of the knife, and the cataract, particles of the latter being easily stripped off and retained there, together with portions of bruised iris and capsule. I do not think that in more than two cases out of a hundred I could trace the origin of reaction to the centre of the wound.

The reactive processes which in the last hundred cases disturbed the recovery more or less were, briefly enumerated, the following :—

1. Slow closure of the wound, from a bead of vitreous keeping the lips of the wound apart, in 2 cases; result good.
2. Re-opening of the wound and diffuse hyalitis, 1 case; result good.
3. Superficial corneal ulcer, probably accidental, 1 case; result good.
4. Spongy exudation, 2 cases; results good.
5. Genuine iritis, from subsequent exposure, 1 case; result good.
6. Plastic capsulitis, 2 cases; results good.
7. Cyclo-capsulitis, 1 case; failure.
8. Diffuse and plastic hyalitis, 1 case; result good.
9. Irido-cyclitis, 6 cases; result good in 1, moderate in 3, failure in 2.
10. Suppuration of the cornea, 2 cases, after smooth operations; one of the patients had a chronic dacryocystitis, which, from exposure on a long winter journey, developed two days after the operation into a phlegmon of the sac, with infiltration of the corneal wound; the other patient, excessively timid and diffident, kept himself in a profuse perspiration the first night and next day; suppuration on the third. Both cases failures, of course.

To recapitulate :—reactive processes in 19 cases out of a 100; 5 failures.

This brings me to the visual results.

In 166 successive cases of complicated as well as uncomplicated cataract.

S was	20/20	in	15	cases,	*i.e.*,	9	per cent.
„	20/30	„	28	„	„	17	„
„	20/40	„	22	„			
„	20/50	„	21	„			
„	20/70	„	31	„	„	19	„
„	20/100	„	21	„			
„	20/200	„	11	„			

S 20/200—20/20 in 149 cases, = *i.e.*, 89·70 per cent.

S was	15/200	in	2	cases.
,,	10/200	,,	1	case.
,,	8/200	,,	1	,,
,,	5/200	,,	1	,,
,,	4/200	,,	2	cases.
,,	3/200	,,	1	case.
S 3/200—15/200		in	8	cases, = *i.e.*, 4·82 per cent.
S was	1/8	in	3	cases.
,,	0	,,	6	,,
S	0—1/8	in	9	cases, = *i.e.*, 5·48 per cent. (100)

If, as is customary, we classify these three groups into good results, moderate results, and failures, we obtain, disregarding the decimals, 90 per cent of good results, 5 per cent. of moderate results, and 5 per cent. of failures. You will notice that I have put three cases with quantitative perception of light simply among the failures, and that I have not excluded the complicated cataracts. These visual results were compiled from the last notes to be obtained. Some of them were taken at the discharge of the patients, others months or years later, and others, again, when after-operations had been performed.

The number of after-operations was considerable. In the first 66 cases, they numbered 26 at the date of publication, but some have been added since. In the last 100 cases, which are not yet published, 43 after-operations were performed, namely:—

1. Iridectomy in 3 cases of closure of the pupil by irido-cyclitis. Result in 1 case moderate, in the 2 others the pupil closed again.

2. Iridotomy in 2 cases of false pupillary membranes. Results satisfactory.

3. Discission of the opaque or wrinkled capsule with a needle in 38 cases. Result good in all. The form of needle which I have found most suitable has a sharp edge on one side, and is blunt on the other. It may be called a knife-needle. I have a set of such needles, the cutting edge varying in length from three to six millimetres. I prefer a straight to a curved needle, because the latter does not pierce the tissues so easily as the former, which in tough capsules is of importance. The discission should always be done under oblique illumination, so that the course and effect of the needle can be accurately watched. I do not make an irregular, multiple laceration of the capsule, as is ordinarily done with one or two of Bowman's stop needles; I make a well-defined ⊥ shaped, or crucial incision. It is essential to have the thickness of the stem of the needle exactly proportioned to the size of the cutting part, so that no more than a minimum quantity of aqueous escapes. The pupil being dilated by atropia, I first make a horizontal incision, corresponding in position to the lower edge of the non-dilated pupil; then I turn the needle on the flat, and push its point over the upper part of the capsule, as high as the base of the coloboma, where the capsule is transfixed again, and slit down to the horizontal incision. If the opening thus gained appears insufficient, I split in the same way the lower part of the capsule adjacent to the horizontal incision, thus converting the ⊥ shaped into a quadrangular opening. If the capsule is tough, and not readily cut, another needle is introduced, and the division made according to the well-known double-needle procedure.

The reaction after the discission is very insignificant; either none at all, or only a slight circumcorneal redness for a day or two. Vision is nearly always improved; never, thus far, have I seen it made worse.

I perform this after-operation in all cases where the acuteness of vision is 20/70 or less, and have done it as early as the fifteenth day after the operation, or weeks or months later, with equal satisfaction. The indications should not be furnished by the visual tests alone, but also by oblique illumination, and the ophthalmoscope, which will determine how much the lack of good sight is due to opacity and folding of the capsule.

In order to show how long after the extraction the discission was made, and how much the sight was improved by it, I have tabulated the 38 cases in which it was performed in the last 100 extractions.

No.	Time of Discission after Extraction.	S.		No.	Time of Discission after Extraction.	S.	
		Before Discission.	After Discission.			Before Discission.	After Discission.
1	14 days.	20/100	20/20	20	5 weeks.	20/70	20/20
2	" "	20/100	20/30	21	" "	20/70	20/30
3	" "	20/100	20/50	22	" "	20/100	20/40
4	" "	20/100	20/70	23	" "	20/100	20/30
5	16 "	20/50	20/20	24	" "	20/100	20/30
6	" "	20/200	20/100	25	" "	20/100	20/100
7	19 "	20/100	20/30	26	6 "	20/60	20/30
8	" "	20/50	20/30	27	" "	20/60	20/40
9	20 "	20/100	20/40	28	" "	20/200	20/50
10	3 weeks.	20/50	20/40	29	2 months.	20/200	20/50
11	4 "	20/100	20/40	30	" "	20/200	20/20
12	" "	8/200	20/200	31	" "	20/200	20/40
13	" "	20/100	20/70	32	" "	20/100	20/70
14	" "	20/200	20/30	33	3 "	1/200	15/200
15	" "	20/200	20/70	34	" "	20/50	20/30
16	" "	20/200	20/30	35	" "	1/200	5/200
17	" "	20/100	20/50	36	5 "	20/200	20/200
18	31 days.	20/200	20/70	37	" "	20/200	20/50
19	33 "	20/200	20/50	38	1 year.	20/200	20/40

The table shows that in 37 cases the vision was materially improved, in one left as before. In one case only the operation was followed by low but long reaction. It was a case of complicated cataract, in which also the extraction had been followed by slow irido-cyclitis.

The essential features of the method of extraction with peripheric division of the capsule may be summed up as follows:—

(1.) It simplifies the operative procedure of extraction, making unnecessary the introduction of an instrument into the anterior chamber for the opening of the capsule.

(2.) The capsule is cut, not torn open, placing the healing of the lesion in a much better condition, as an incised wound is less dangerous than a lacerated wound.

(3.) Portions of capsule are not so easily and extensively crowded into the corneal section as after central cystotomy.

(4.) The ready closure of the capsular opening shuts up remnants of cataract; thus preventing them, as well as shreds of capsule, from coming in contact with the iris and the walls of the anterior chamber, particularly the parts near the corneal section.

(5.) These conditions unite in warding off many reactive processes to which the central, multiple and irregular laceration of the capsule is liable.

[illegible]

[illegible]

[illegible]

would be compatible with a safe and sure exit of the lens. I made a large horizontal opening along the edge of the lens, joining to it a vertical incision. This method, gentleman, is, perhaps, the best of all. At first I used it exclusively, assuming that the escape of a large lens would be easier by it. The results were very good. Gradually, however, I found that even a large lens may slip through a mere horizontal opening; and having observed that this opening closed in the first night, I caught the idea that in this way the lens might be expelled, and yet the eye be inflicted with no greater lesion than that which an iridectomy produces. Now I began to experiment under guidance of this idea. I made small openings, which were in many cases harmlessly enlarged by the emerging lens; in others, however, where the capsule was tough, they led to difficulties in the exit of the lens, bruising of the iris and corner of the wound, to rupture of the zonula and prolapse of vitreous, necessitating in two instances the introduction of a traction instrument. Even when the lens escaped readily through a small opening in the capsule, this opening was commonly angular and irregular. Experience, therefore, demonstrated the dangers of an insufficient capsular opening, as it has long demonstrated those of an insufficient corneal section. Even with the correct performance of every other step of the operation, and the most careful attendance to sanitary rules, I think that the rate of success of cataract extraction, both in the number of cures and the acuteness of vision, can be increased by replacing the central opening of the capsule by the peripheral. In this country, Dr. Fitzgerald, of Dublin, made a communication in favour of this method in 1879. In a paper appearing in the forthcoming number of the *Archives of Ophthalmology* (*Archiv für Augenheilkunde*), I have given a detailed and critical report of the last (the seventh) hundred of peripheric linear extractions which I have made. The subject of peripheric capsulotomy there is discussed more at length than I could have permitted myself to do in this place. For literary statements I also refer to that paper, thinking that my humble contributions to the work of the Congress would be more acceptable if I gave you my personal experience and views, than lengthily cited what others have written.

DISCUSSION.

Dr. Gayet, Lyons: As early as 1873 I proposed a similar operation, under the name of "Equatorial discission." My object was to avoid opening the centre of the capsule, in order to prevent the formation of secondary opacities, which invaded it when the lens had passed through that part of its capsule. It has, however, not entirely fulfilled my expectation. I found the procedure easy, and do not think that any new instruments are needed; the knife suffices for opening the capsule. It is not applicable when the centre of the anterior part of the lens is changed, nor when the lens is atrophied, nor when the zonula is stretched. In fact, the operation has not realized my hopes by giving better and more lasting acuteness of vision.

Des opérations contre le Glaucome dans ses formes différentes.

Dr. L. de Wecker, Paris.

Bien qu'il s'agisse, pour les honorables membres de cette assemblée, de porter un jugement sur les opérations anti-glaucomateuses en général, nous pensons que, dans l'intérêt de la clarté et de l'utilité pratique de la discussion, la question doit être

restreinte à l'emploi des deux seules opérations usitées pour le trai glaucome : l'iridectomie et la sclérotomie.

Si les organisateurs de ce congrès ont bien voulu songer à moi pou débat, c'est, je pense, qu'ils ont désiré faire choix d'un confrère qui, ayan sur une très-vaste échelle ces deux genres d'opérations, se trouverait par dans des conditions favorables pour aborder ce sujet. Je ferai tous ı pour justifier leur confiance, en exposant avec la plus entière franchise ment que m'a fourni mon expérience, quoique je ne puisse me défendr tain embarras, en songeant à la suspicion que peut aisément faire nai premiers instigateurs d'une des opérations curatives du glaucome.

La merveilleuse découverte de notre maître à tous, *de Graefe*, eut-ell cable, avec un égal succès, à toutes les formes et genres de glaucome, pe demment n'aurait songé à substituer à l'iridectomie une autre opératio non seulement pour un groupe important de glaucomes, l'iridectomie sante dans son action, mais encore dans certains cas trop fréquents, ell désastreuse.

Ceux qui se bornent à l'emploi exclusif de l'opération de notre maitr déclarant satisfaits, repoussent, avec un sentiment de surprise, que nc sincère du reste, toute idée de substitution de la sclérotomie à l'iridec des confrères qui, sur un champ d'observation souvent peu vaste, ont chance de ne rencontrer surtout que des cas favorables à l'iridectomie, e pas été à même de contrôler pendant 15 ou 20 ans la vision d'un no notable de leurs opérés.

Quant à ceux qui ont été appelés à traiter de très-grandes séries mateux, ils devaient forcément se convaincre que le précieux moyen cu *Graefe* leur avait mis entre les mains était insuffisant et encore assez so emploi dangereux. Aussi, suivant le tempérament de chacun, falla résigner ou perfectionner.

Peu enclin à la résignation, mais très-désireux de guérir le plus gra possible de mes glaucomateux, je me suis tout d'abord préoccupé de cas de glaucome où l'iridectomie montrait surtout son merveilleux pouv de ceux dans lesquels cette opération offrait moins de certitude et po devenir périlleuse. Je dois ajouter que de ce côté la voie se trouvait d par les aveux mêmes de notre maître.

Incontestablement, l'acuite du processus glaucomateux ainsi qu d'irritabilité de l'œil est en raison directe de l'action curative de l'i Par contre, plus le mal est chronique, plus les symptômes irritatifs f moins on peut compter sur une action favorable résultant de l'excision beau de l'iris.

Et notons immédiatement ceci, c'est que la puissance curative de l'i est d'autant plus manifeste que, par suite d'une exagération de pl accentuée de la pression, l'éxécution correcte de l'opération (sans encla l'iris) est rendue plus difficile. Aussi n'y a-t-il rien de bien paradoxal l'on guérit plus de glaucomes avec des iridectomies mal exécutées excisions faites *lege artis*.

Comme notre but n'est pas d'entrer dans des discussions théoriques, de chercher à élucider exclusivement le côté pratique de la thérapeutiq come, nous poserons immédiatement la question comme suit : à savoir si, c la puissance curative de l'iridectomie dans les cas de glaucome aigu toute substitution d'une autre opération est rendue ici inutile, et si seul

formes absolument chroniques et non irritatives l'opportunité d'une pareille substitution doit être agitée.

Cette simplification aurait été justifiée, si dans le groupe des formes aiguës ne se glissaient pas des cas de glaucomes malins ou hémorrhagiques qui rendent l'emploi de l'iridectomie parfois très-périlleuse, et si l'action curative de cette opération ne s'épuisait pas à la longue pour un certain nombre de cas aigus, correctement ou incorrectement opérés. Là encore, dans le groupe des glaucomes irritatifs, on se trouve donc dans l'obligation de recourir à un second mode opératoire qui, je le pense, a prouvé son efficacité, c'est-à-dire à la sclérotomie.

Toutes les fois qu'il y a le moindre soupçon sur l'existence d'une fragilité des vaisseaux ou d'un état variqueux imprimant au glaucome un caractère hémorrhagique, lorsque l'attaque a succedé à une rétinite apoplectiforme, que le bord pupillaire montre (ainsi que M. Abadie l'a fait observer) une couleur analogue à la rouille, ne précipitez rien, faites tout d'abord une sclérotomie, répétez même au besoin cette opération, et vous pourrez alors sans péril faire suivre celle-ci d'une iridectomie, si vous avez une plus grande confiance dans son action curative définitive. En s'aidant de l'emploi des myotiques, la sclérotomie n'est pas plus difficile en pareil cas que l'excision de l'iris, et sa puissance d'action pour combattre même les symptômes les plus violents de l'attaque glaucomateuse ne fera de doute pour quiconque aura souvent eu recours à cette opération.

En faisant, tout d'abord, dans tous les cas de glaucome aigu sur la nature bénigne desquels pourrait planer le moindre doute, une sclérotomie, on évitera la rencontre si fâcheuse et parfois si imprévue d'un glaucome malin, et on élargira notablement le terrain sur lequel peut s'exercer l'action curative de l'iridectomie que personne moins que moi ne songe à chasser du domaine où elle s'est incontestablement établie en souveraine.

Cette même superiorité que garde l'iridectomie dans ces cas déterminés, je la revendique pour la sclérotomie, quand il s'agit du groupe des glaucomes chroniques simples, dépourvus de tout symptôme irritatif. Ici on échappera à deux dangers sérieux auxquels expose l'iridectomie. En premier lieu on évitera une dépréciation sensible de la vue si le rétrécissement du champ visuel menace déjà de déborder le point de fixation, l'excision de l'iris amenant fréquemment ce résultat de faire sauter dans ce cas la limite interne du champ visuel au delà du point de fixation ; de façon à abolir toute vision centrale et à ne laisser subsister qu'une vision indirecte en dehors. En second lieu l'iridectomie entraînera presque constamment la production d'un astigmatisme et des éblouissements, phenomènes facheux qui effraient et découragent le malade, alors même que l'opération n'a pas amené une véritable réduction de l'acuité visuelle. Les recherches qu'un de mes élèves, M. Manolescu de Buckarest a presentées au congrès d'Amsterdam, ainsi que l'expérience que j'ai encore acquise depuis, m'ont prouvé que l'action curative d'une sclérotomie bien executée est supérieure ou au moins équivalente à celle de l'iridectomie, et cela, sans présenter les inconvénients et les dangers de l'excision de l'iris. Et, à ce sujet, nous supplions nos confrères qui débutent dans la pratique de cette opération de bien vouloir ne pas attribuer à une impuissance de la sclérotomie ce qui doit être mis sur le compte d'une exécution opératoire imparfaite.

Que ceux qui hésitent à abandonner une opération dont les résultats souvent brillants, il est vrai, expliquent leur attachement pour elle, veuillent bien néanmoins commencer à appliquer la sclérotomie.

1° Dans les cas où l'excision de l'iris se montre fort périlleuse, c'est-à-dire dans

le glaucome hémorrhagique et le glaucome congénital, autrement dit l thalmie.

2° Qu'ils pratiquent la simple section sclérale dans les cas de glaucom où l'excision de l'iris, quoique toute virtuelle, peut conduire, par l'accroi des douleurs à l'énucléation, opération à laquelle on échappera suremen sclérotomies répétées.

3° Qu'ils aient recours à la sclérotomie comme opération complémentair soit immédiatement, soit ultérieurement, l'iridectomie n'atteint qu'incomp son but thérapeutique. Ici encore la sclérotomie répétée me parait, s ce qui concerne les formes chroniques du glaucome, d'un effet supérieur à l artificielle primitivement pratiquée, la seconde opération étant faite du cô à la première restée impuissante.

Si les partisans les plus ardents de l'iridectomie s'engagent dans cett arriveront sûrement ainsi à éviter les dangers imprévus de leur opératio et à la seconder efficacement là où elle se montre défaillante dans son ac faitrice. Plus tard, l'expérience qu'ils auront ainsi acquise les conduir inconsciemment à substituer la sclérotomie à l'iridectomie dans les for ment chroniques du glaucome.

Après avoir suivi moi-même cette ligne de conduite que mes honor frères voudront bien me permettre de leur conseiller, je puis me félicit échappé aux surprises douloureuses que réservait parfois le traitement c du glaucome. Certes, je n'affirme pas que l'on puisse guérir ainsi t formes chroniques du glaucome et que les cas dans lesquels s'observe dè une blancheur marquée des papilles soient sûrement traités avec succ sclérotomie, cette infallibilité chimérique n'est pas plus réservée à l l'autre de ces opérations, mais ce que je soutiens avec une entière convi qu'en combinant ces deux modes opératoires on assistera bien plus ra triste spectacle de voir dépèrir sous ses propres mains la vision des gla refractaires, ainsi qu'il arrive nécessairement dans un certain nomb lorsqu'on s'obstine à n'user exclusivement que de l'excision de l'iris.

Je n'ai été guidé dans mes recherches que par l'unique désir d'o guérisons plus parfaites et plus nombreuses, la pratique de ces dernièr m'ayant démontré que je m'étais engagé dans la bonne voie, j'ai mai conviction que les compagnons de route ne me feront pas défaut.

Sclerotomy in Glaucoma.

Mr. C. Bader, London.

By bringing before you the following cases of glaucoma treated by s I wish to prove—1st, that the kinds of glaucoma usually treated by iride be treated, and more successfully, by sclerotomy; 2ndly, that, to secure is desirable to obtain, and to maintain, a staphyloma of the conjuncti without prolapse of the iris.

These cases also show the truth of the second proposition—*i.e.*, the c of a staphyloma of the conjunctiva, with or without prolapse of the iris. no better method to secure this than the kind of sclerotomy by whi sclerotic flap is made close to the insertion of the iris, leaving part of tl tiva adjoining the sclerotic wound undivided. I consider the occurrence of the iris a favourable accident, and the non-occurrence of staphyloma

junctiva as an unfavourable symptom. All steps of the operation, and of the after-treatment, must tend to secure a bulging of conjunctiva, or of the conjunctiva and iris, as a safety-valve to too high tension of the eyeball.

The following living specimens were shown in confirmation of Mr. Bader's statements:—

Sclerotomy.—Acute glaucoma both eyes.—Case, aged 70. Seen in consultation with Dr. Jackson, Church Street, Spitalfields. Perception of light only.

October 11, 1875.—*Sclerotomy.*

November, 1875.—T. n., small iris bulge and leakage.

August, 1881.—T. and elasticity normal; leakage as before. Since age of forty-five patient used convex lenses for reading. For three years after operation she could read the finest type with both eyes without spectacles.

Glaucoma after cataract extraction.—Case, aged 50. Had cataract removed elsewhere by upward section; adhesion of iris to cornea followed. I removed cataract from left eye by downward section. Glaucoma appeared in the right eye, which I sclerotomized, taking care to cut through the adherent iris.

August, 1881.—Sight of left eye normal. Right, all glaucoma disappeared.

Glaucoma with chronic inflammation and myopia.—Case, aged 63. Seen by several London eye surgeons. Right eye, bare perception of light; left, good perception of light.

October, 1879.—*Both eyes sclerotomized.* On third day after operation T— and good protrusion of conjunctiva and iris.

October, 1880.—Good leakage. Left eye reads ordinary type; right has good perception of light.

Simple glaucoma.—Case, age 35. Seen in consultation in 1871 with Dr. Stillwell, of Beckenham. Patient accidentally found left eye blind; right glaucoma. Refused operation.

In 1876 guides himself with difficulty; simple glaucoma more advanced. Iridectomy operation.

In 1877 *bare perception of light; submitted to sclerotomy;* very large protrusion of conjunctiva and iris.

December, 1880.—Can see to guide himself with difficulty. T.n.

Indications de la Sclérotomie.

Dr. Ch. Abadie, Paris.

La théorie indique que s'il existe certaines formes de glaucome réellement dues à ce que les voies de filtration de la région scléro-cornéenne sont oblitérées, la chambre antérieure doit nécessairement ou augmenter en profondeur ou tout au moins conserver ses dimensions normales. L'observation clinique confirme précisément ces prévisions théoriques, et c'est dans le glaucome chronique simple et dans certaines formes d'hydrophthalmie, où ces conditions existent, que la sclérotomie donne les meilleurs résultats.

J'ai remarqué que l'influence exercée par la sclérotomie est d'autant plus grande et d'autant plus durable que l'affection est moins ancienne. Cette observation est facile à faire dans les cas de glaucome chronique simple qui frappe les deux yeux, l'œil le plus désorganisé bénéficie beaucoup moins que l'autre de l'opération. J'ai obtenu dernièrement un succès éclatant chez un jeune homme de dix-huit ans atteint d'hydrophthalmie congénitale, qui après être restée stationnaire avait pris

une marche progressive avec développement de phénomènes glaucomateux. Au moment de mon intervention il ne restait plus qu'un peu de perception lumineuse du côté temporal à droite. A gauche la maladie semblait prendre la même tournure et la vision baissait rapidement; des deux côtés la tension était excessive. Une double sclérotomie fut pratiquée. Elle a suffi pour ramener et maintenir définitivement à la normale la tension de l'œil gauche. Tandis qu'à droite il a fallu la répéter à trois reprises différentes et la tension reste encore elevée. Le succès obtenu sur l'œil gauche est des plus encourageants cas; on sait combien ces cas-là sont rebelles à tous nos moyens d'action. La sclérotomie me parait appelée dans un avenir plus ou moins éloigné à remplacer la paracentèse de la chambre antérieure. Elle offre sur cette dernière l'avantage d'avoir une action plus durable, les lèvres de la plaie se refermant moins facilement et assurant ainsi un écoulement plus prolongé de l'humeur aqueuse. En outre elle s'exécute avec le couteau de Græfe qui est toujours d'un maniement plus facile et moins dangereux que le couteau lancéolaire. En ce qui concerne le manuel opératoire on doit recommander de faire la section aussi lentement que possible; on évite ainsi la hernie de l'iris, et l'affrontement des lèvres de la plaie se fait moins facilement, ce qui est le but à atteindre.

Dans le cas où le glaucome résiste à l'iridectomie et à la sclérotomie il y a lieu d'essayer d'empêcher la perte fatale de l'œil en agissant sur les vaisseaux et nerfs ciliaires postérieurs et en pratiquant la dénudation du pôle postérieur. Mais c'est un moyen qui reste encore plus théorique que pratique et qui a besoin d'être étudié expérimentalement et cliniquement.

Zur Sclerotomie.

Professor H. Schoeler, Berlin.

(Communicated by Professor Leber, Göttingen).

Ein Beitrag gegen die Filtrationsfähigkeit der Scleralnarben.

(Nach einem Vortrag in der *Berliner Med. Gesellschaft*, vom 6 Juli, 1881.)

Soll die Sclerotomie fernerhin nicht das Schicksal der Hornhautparacentesen beim Glaucom theilen, so muss die Filtrationsfähigkeit der Narbe erwiesen werden. Diesen Nachweis zu führen, oder dieselbe von der ihr beigelegten Fähigkeit zu befreien, war der Zweck folgender, kurzer experimenteller Versuchsreihen.

Als Versuchsthier benutzte ich das Kaninchen, bei welchem unzweifelhaft von verschiedenen Beobachtern Glaucom beobachtet worden ist, wiewohl eine sichere Methode der experimentellen Erzeugung derselben bisher noch fehlt.

In verschiedenster Ausdehnung von 4 bis 10 Mm. Länge wurden mit dem schmalen Messer Sclerotomien am Scleralbord in einem Abstand von ½ bis 1½ Mm. vom Limbus corn. entfernt ausgeführt.

Entweder wurde die Sclera vollständig durchschnitten oder eine Conjunctivalbrücke oder Scleralbrücke in dem Scheitel der Lappenwunde stehen gelassen. Die Zahl der Sclerotomien an ein und demselben Auge schwankte von 1 bis 5, welche successive nach Verheilung der zuvorgegangenen ausgeführt wurden. Desgleichen wurde die Sclerotomie mit Irisexcision kombinirt und ferner cystoide Vernarbung absichtlich wie unabsichtlich herbeigeführt. Zur Bestimmung der Filtra-

tionsgrösse aus dem Auge bediente ich mich eines Manometer's mit Leber'scher Einstichscanüle, welches in die vordere Kammer eingeführt wurde.*

Bei allen Versuchen wurde die Ausgangstellung von annähernd 27 Mm. Hg. Druck gefunden, etwaige kleine Abweichungen dabei ausgeglichen durch künstliche Herabsetzung oder Steigerung des intraoculären Druckes bis auf obigen Werth. Die künstliche Steigerung erfolgte dann stets auf 100 Mm. Hg. Druck über die Ausgangsstellung. Als Beobachtungsdauer wurden 25 Minuten bestimmt, welche zur Wiederkehr normaler ständiger Druckverhältnisse erfahrungsgemäss meist reichlich ausreichen. Die Filtrationsgeschwindigkeit wurde nicht nur gemessen, sondern auch nie versäumt die Beschaffenheit der Narbe auf Flüssigkeitsausscheidung mittelst Fliesspapier wiederholt zu prüfen und unter Loupenvergrösserung ihre Oberfläche zu besichtigen. Nach Beendigung der Messung wurde dann meist nochmals der Druck im Auge bis auf 200, 300, resp. 400 Mm. Hg. gesteigert, um eine künstliche Berstung der Narbe zu Stande zu bringen. Als Injectionsmasse bediente ich mich einer schwachen Kochsalzlösung, welche bisweilen mittelst Carmin intensiv roth gefärbt wurde.

Was nun die Hauptfrage anbetrifft, so ist bei sämmtlichen Versuchen niemals eine Beschleunigung der Filtration am sclerotomirten Auge gegenüber dem gesunden beobachtet worden.

Die einzelnen Messungen sind am 80., 41., 22., 14., 10., 8., und 4. Tage nach der Ausführung der Operation vorgenommen worden. Unter den 8 Fällen sind zwei mit cystoider Vernarbung und einer mit einer Irisexcision aufgeführt. Mit Ausnahme eines Falles waren die Unterschiede in der Filtrationsgeschwindigkeit innerhalb 25 Minuten so geringfügige, dass dieselben unter die Rubrik der Beobachtungsfehler zu stellen sind. Will man das hingegen nicht, so sprachen die Differenzen alle im Sinne einer Verlangsamung der Filtration am sclerotomirten Auge. Nur in einem Falle, wo nach 14tägiger Heildauer der Sclerotomiewunde manometrische Messungen vorgenommen wurden, betrug der Abfall am gesunden Auge 92 Mm., am sclerotomirten hingegen 80 Mm. Hg. innerhalb 25 Minuten. Die Ausgangsstellung war wie immer 27 Mm. Hg. gewesen, die Drucksteigerung 100 Mm. Hg.

Wie die Loupenbetrachtung und das Betupfen mit Fliesspapier lehrt, blieb in allen Fällen bei diesen Drucksteigerungen die Narbe resp. ihr breites Zwischengewebe trocken. Selbst in dem Falle, wo nach 3×24 Stunden nach der Sclerotomie die Messung angestellt war, filtrirte das Narbengewebe nicht. Wurde hingegen der Druck noch weiter auf 200—300 Mm. Hg. über die Ausgangsstellung gesteigert, also ein Druck erzeugt wie derselbe sicher keinem pathologischen Processe am Kaninchenauge eigen ist, wobei der Bulbus steinhart wurde, so blieb das Zwischengewebe nicht mehr trocken. Mit Ausnahme eines Falles, wo die Sclerotomie mit Irisexcision kombinirt war, und nach 22tägiger Heildauer selbst bei 300 Mm. Hg. Druck die Narbe trocken blieb, trat bei dem Falle von 10tägiger Heildauer die Durchfeuchtung des Zwischengewebes bei 240 Mm. Hg. Druck ein, während bei den Fällen von 14-und 41tägiger Heildauer dieselbe erst bei 300 Mm. Hg. Druck beobachtet wurde. Leider konnte an dem Versuchsthiere nach 3tägiger Heildauer die Widerstandsfähigkeit des Zwischengewebes gegen höheren Druck nicht bestimmt werden, da das Thier inzwischen infolge des Chloroform's verschied. Für den Fall von 80tägiger (überhäuteten Irisvorfall) wie denjenigen von 8tägiger Heildauer, hatte ich mich beschränkt auf den Nachweiss, dass bei 200, resp. 240 das Zwischengewebe noch trocken blieb, nicht aber

* Cf. Arch. f. Ophth., Bd. xxv. Abthl. 4.

den Berstungsdruck festgestellt. Während in dem Falle von 41tägiger E eine feine, gleichmässig tropfenförmige Durchfeuchtung des Zwischengew Loupenbetrachtung wahrgenommen wurde, platzte in dem Falle von 1 Heildauer das Zwischengewebe an einem Punkte, aus welchem dann Flüssigkeit hervorquoll.

Höchst überraschend, zugleich jedoch höchst lehrreich gestaltete sich Verhalten der Filtration bei cystoider Vernarbung. In einem dieser Fä wie bereits erwähnt, bei 200 Mm. Hg. Druck über der Ausgangsstellung häutete Irisvorfall völlig trocken, (80tägige Heildauer), während bei dem am unteren Wundrande eine Stelle von Zeit zu Zeit einen punktförmig sigkeitstropfen austreten liess, wie mit Fliesspapier nachgewiesen wurde. 100 Mm. Hg. Druck für Flüssigkeiten permeable Parthie war bei der betrachtung nicht sichtbar, nahm auch bei 200 Mm. Hg. die Ausscheidu zu, sondern versiegte sogar bei noch höherer Drucksteigerung, bis endli 300 Mm. Hg. ein Platzen des Vorfalles eintrat. Wahrscheinlich war höheren Druck durch stärkere Vorwölbung des Irisvorfalles ein pfropfart schluss dieser noch nicht überhäuteten Stelle eingetreten. Die eigentlich Narbe hingegen blieb während der Zeit bis zu ihrem Bersten, wie im and suche, völlig trocken. Dieses Prototyp der Filtrationsnarbe, wie die bisher genannt wurde, filtrirt demnach durchaus nicht, sondern lässt nur F durch, wenn ein Bersten des verdünnten Narbenscheitels statthat; dam nun ganz vortrefflich das, was die klinische Beobachtung lehrt, bisher jed gedeutet wurde. Auch hier sieht man nur von Zeit zu Zeit in grossen I von Monaten ja selbst Jahren einen subconjunctivalen Flüssigkeitser gleichzeitigem Einsinken ihres blasenförmigen Scheitels; wohl Niemand dürfte sich rühmen, eine stetige Ausscheidung aus derselben wahrgeno haben, sobald die narbige Ueberhäutung desselben, welche hier bereits tägiger resp. 41tägiger Heildauer eingetreten war, sich vollzogen hat. ersteren Falle von 14tägiger Dauer war erst in Folge der zweiten Sclero Irisvorfall eingetreten. Während nach der ersten Sclerotomie die mano Messung am gesunden Auge in 25 Minuten einen Abfall von 100 Mm 0 Mm. Hg., im sclerotomirten hingegen von 100 auf 2 Mm. Hg. ergel somit die Filtrationsgeschwindigkeit bei beiden als gleich zu betrachten w eine erneuerte Messung nach der zweiten Sclerotomie Folgendes.

Trotz nicht völliger Impermeabilität der Randparthie der Narbe, erfo Minuten am sclerotomirten Auge jetzt der Abfall von 100 Mm. Hg. auf n während am gesunden die Abscheidungsgrösse 98 Mm. betrug, somit de 2 Mm. über die Ausgangsstellung betrug.

Hiermit berühren wir die zweite Frage, wie wiederholte Sclerotomie Während bei einer Sclerotomie der beschleunigende Einfluss des Schnitt Filtration mit grösster Bestimmtheit verneint werden konnte, blieb eine samung der Filtration durch dieselbe angesichts eines einzigen dafür reden höchst zweifelhaft.

Hingegen sind nun in allen Fällen, wo mehrere Sclerotomien ausgeüh die zur Beobachtung gelangten Werthe der Filtrationsgeschwindigkeit ganz ausnahmslos gewesen, dass mit grösster Bestimmtheit daraus die mende Wirkung mehrerer Sclerotomien auf die Filtration des Auges u hervorgeht. In 25 Minuten fiel der Druck von 100 Mm. Hg. über der stellung nach 2maliger Sclerotomie auf 20 Mm. Hg., während bei gesun bis auf 2 Mm. das Hg. sank. Nach 3maliger Sclerotomie wurden an

Auge 46 Mm. Hgstand, am gesunden Auge 28 Mm. Hgstand; in einem andern Falle nach 4maliger Sclerotomie 44 Mm. Hgstand am kranken und 0 Mm. Hg. am gesunden Auge bei der gleichen Drucksteigerung auf 100 Mm. Hg. in 25 Minuten registrirt.

Nach 5maliger Sclerotomie betrug beim sclerotomirten Auge der Hgstand 14 Mm., unter gleichen Bedingungen am gesunden Auge der Hgstand 0 Mm.

1. *Versuch.*

Graues Kaninchen.—Am 8. April d. J. wird am rechten Auge in einem Abstande von ca. $\frac{3}{4}$ Mm. vom Limbus corn. mit dem schmalen von Graefeschen Messer eine Sclerotomie von 7—8 Mm. Länge ausgeführt. Nach Durchschneidung der Sclera bleibt entsprechend dem mittleren Drittel des Schnittes eine Conjunctivalbrücke undurchschnitten stehen. Bei der Operation kommt es zu keinem Iris- noch Glaskörpervorfall, desgleichen heilt die Wunde ohne bemerkenswerthe Wundreaktion. Am 16. April, also nach 8 Tagen, ist die Wunde mit breitem schwärzlichem Zwischengewebe geheilt. Iris frei, vordere Kammer von mittlerer Tiefe. In der Narkose wird jetzt die Leber'sche Canüle geschlossen in die vordere Kammer des operirten Auges eingeführt. Nach Oeffnung derselben stellt sich in dem mit der Canüle in Verbinduug stehenden Manometer der Druck auf 27 Mm. Hg. Die Einführung erfolgte ohne Abfluss von Kammerwasser, Stichöffnungen trocken. Durch Injection einer schwachen Cl.Na. lösung von derselben Concentration(1%),wie die im Manometerrohre zur Füllung benutzte, wurde nun langsam der Druck auf 100 Mm. Hg. über die Ausgangsstellung gesteigert und nach Abschluss des Kautchukrohres an der dreischenkligen Canüle * der Abfall der Drucksteigerung beobachtet. Am gesunden Auge war der Modus procedendi der gleiche.

Von 100 *Mm. Hg. sinkt das Hg.*

Nach $\frac{1}{2}$	Minute	am sclerotomirten Auge	auf 92	Mm. Hg.,	am gesunden	auf 94	Mm. Hg.
„ 1	„	„	64	„	„	78	„
„ 2	„	„	56	„	„	70	„
„ 3	„	„	50	„	„	58	„
„ 5	„	„	42	„	„	48	„
„ 8	„	„	30	„	„	38	„
„ 10	„	„	26	„	„	32	„
„ 12	„	„	24	„	„	28	„
„ 15	„	„	20	„	„	20	„
„ 20	„	„	20	„	„	19	„

Während der Versuchsdauer blieben nicht nur die Stichöffnungen trocken, sondern konnte auch mittelst Fliesspapier aus dem breiten Zwischengewebe der leicht prominenten und reichlich vascularisirten Narbe keine Flüssigkeit aufgesogen werden, wie häufig wiederholte Versuche bestätigen. Steigert man den Druck auf 240 Mm. Hg. über die Ausgangsstellung, so blieb die Scleralwunde völlig trocken, und entwickelte sich unterhalb derselben entsprechend der Muskelinsertion eines Geraden ein mächtiges Conjunctivaloedem, desgleichen durchfeuchtete sich der übrige Limbus gleichmässig.

Am 23. April wurde nun an demselben Kaninchen zum 2. Mal und am 29. dess. Monats zum 3. Male die Sclerotomie ausgeführt. Das 2. Mal wurde dasselbe mit

* Cf. Arch. f. Ophth. Bd. xxv. Abthl. 4.

Conjunctivalbrücke, das 3. Mal ohne dieselbe sclerotomirt. Die Länge der betrug 8–10 Mm. bei ca. 1 Mm. Abstand vom Limbus und entsprach ihre Muskelinsertion des oberen und unteren geraden Augenmuskels.

Am 6. Mai wurde, nachdem die Scleralwunde verheilt war, die gleich metrische Bestimmung, wie zuvor ausgeführt. Ausgangsstellung 27 Druck. Drucksteigerung 100 Mm. Hg. über der Ausgangsstellung.

Von 100 Mm. Hg. sinkt das Hg.

Nach ½	Minute	am sclerotomirten	Auge auf	90 Mm. Hg.	am gesunden	auf 88
„ 1	„	„	84	„	„	80
„ 2	„	„	76	„	„	66
„ 3	„	„	70	„	„	56
„ 5	„	„	64	„	„	52
„ 8	„	„	58	„	„	42
„ 10	„	„	56	„	„	34
„ 12	„	„	53	„	„	30
„ 15	„	„	49	„	„	28
„ 20	„	„	48	„	„	28
„ 25	„	„	46	„	„	28

Stichöffnungen trocken, kein Kammerwasserabfluss beim Einstich. nikation zwischen vorderer Kammer und Manometer prompt.

In diesen zwei Versuchen ist die Filtrationsgeschwindigkeit am gesun während der ersten 15 Minuten genau die gleiche geblieben, während am mirten, nach der dritten Sclerotomie, bei der zweiten manometrischen Me 42 Mm. Hg. gegen 80 Mm. Hg. Abfall bei der ersten constatirt worden. somit eine Verlangsamung der Auscheidung um ungefähr die Hälft unden.

2. *Versuch.*

Weisses Kaninchen.—Am 28. Februar d. J. wurde eine Sclerotomie v Länge in 1 Mm. Abstand vom Limbus mit Conjunctivalbrücke ohne Irisv effluvium corp. vitr. ausgeführt. 16. April d. J. wird eine 2. Sclerotomie v Länge 1 Mm. vom Limbus entfernt mit Conjunctivalbrücke an demselbe Auge ausgeführt. Dieselbe kommt nach aussen in 1 Cm. Abstand von zu liegen. Kein Irisvorfall. 3. Mai d. J. die dritte Sclerotomie verbindet früheren. Länge derselben 10 Mm., Abstand vom Limbus 1–1½ Mm. eine Conjunctivalbrücke stehen. Kein Irisvorfall. 12. Mai d. J. 4. S von 8 Mm. Länge mit Conjunctivalbrücke in 1 Mm. Entfernung vor ausgeführt. Am 27. Mai d. J. erscheint das Auge blass, nur di Nachbarschaft der Narben ist schwach vascularisirt. Iris frei mit prom tion, Pupille central. Die Narben bilden einen zusammenhängenden Ri Limbus herum und bleibt nur der untere Theil desselben entsprechend der des M. rectus inf. in einer Ausdehnung von ca 6–8 Mm. frei. Dabei ist d Kammer bedeutend abgeflacht. In gewöhnlicher Weise wird nun a Augen die manometrische Messung ausgeführt. Ausgangsstellung 27 Drucksteigerung 100 Mm. Hg. In beiden Fällen fand minimster Kamm verlust beim Einführen der Stichkanüle statt, blieben aber die Stich während des Versuchs völlig trocken. Die Drucksteigerung wird in bei gleich langsam bewirkt. Pupille mittelweit.

Der Abfall erfolgte von 100 *Mm. Hg.*

Nach ½	Minute	am sclerotomirten Auge	auf 90	Mm. Hg,	am gesunden	auf 88	Mm. Hg.
„ 1	„	„	86	„	„	78	„
„ 2	„	„	78	„	„	68	„
„ 3	„	„	72	„	„	56	„
„ 5	„	„	60	„	„	42	„
„ 8	„	„	48	„	„	20	„
„ 10	„	„	44	„	„	8	„
„ 12	„	„	38	„	„	0	„
„ 15	„	„	30	„	„	0	„
„ 20	„	„	20	„	„	0	„
„ 25	„	„	12	„	„	0	„

Hier, wo nach 4 Sclerotomien eine manometrische Messung angestellt wurde, zeigt sich eine so enorme Verlangsamung (nach 12 Minuten Abfall von 62 gegen Abfall von 100 Mm. Hg.) dass in schlagendster Weise dadurch der verlangsamende Einfluss wiederholter Sclerotomien auf die Filtrationsgeschwindigkeit dargethan ist.

Es lag nun nahe den ganzen Limbus allmälig zu umschneiden und um denselben eine ringförmige Sclerotomiennarbe dadurch zu erzeugen. Auf solche Weise konnte man hoffen, die Filtration schliesslich ganz zum Versiegen zu bringen. Beim Kaninchen ist ein solches Vorhaben unausführbar, da die Narben ohne Glaskörperverlust nicht so peripher angelegt werden können, um alle Filtrationsbahnen dadurch zu einem narbigen Verschluss zu bringen. Ferner bilden sich, wie man wohl ohne Weiteres annehmen kann und die Beobachtung bestätigt, jedenfalls abnorme Abflusswege aus, wenn, wie es hier geschehen musste, die einzelnen Sclerotomien um Tage, ja um Wochen von einander getrennt, ausgeführt wurden. Um die Richtigkeit der mechanischen Erzeugungstheorie des Glaucoms zu prüfen, stimmten hier nicht einmal, wie ersichtlich, die gesetzten Versuchsbedingungen. Angenommen jedoch, dieselben wären da gewesen, so hielte ich es doch für höchst unwahrscheinlich, auf diese Weise ein Glaucom zu erzeugen, da durch Aenderung der Zu- und Abflussbedingungen wohl die Entstehung von Stauung, nicht aber von Entzündung erklärt wird. Dass eine wiederholte Einführung der Stichcanüle auch am gesunden Auge die Filtrationsbedingungen zu ändern im Stande ist, dafür sprechen festgestellte Werthe, wie 72 Mm. Hg. Abfall (nach der 4.) zu 100 Mm. Hg. Abfall an demselben Auge (nach der 5. Sclerotomie). Als constante Thatsache bleibt jedoch bestehen, worauf es hier allein ankommt, dass mehrere Sclerotomien stets die Filtration des operirten Auges im Vergleich zu demjenigen des gesunden Auges herabsetzen und dieses Faktum nicht nur bei mehrfacher, sondern auch nach einmaliger manometrischer Messung (cf. 4mal sclerotomirtes Auge) eintritt. Resumiren wir nun die Ergebnisse aus den angestellten Versuchen, so ergiebt sich:

1. Dass die Iridectomie- wie Scleralnarbe keine Filtrationsnarben sind, desgleichen die cystoide Vernarbung keine stetige Flüssigkeitsausscheidung aus dem Auge vermittelt, sondern nur durch Berstung derselben von Zeit zu Zeit eine Kammerwasserentleerung stattfindet. Daher ist der Schluss per analogiam wohl zulässig, dass es überhaupt keine Filtrationsnarben giebt.

2. Wirkt schon eine Sclerotomienarbe nicht beschleunigend auf die Filtration aus dem Auge, sondern unter Umständen verlangsamend, so ist der Einfluss mehrerer Sclerotomienarben ein eminent verlangsamender auf die Filtration. Wo

bereits Glaucom besteht, wird durch dieselbe demnach eine fortwirkende Schädlichkeitsursache gesetzt, welche nur in unglücklichster Weise den günstigen Einfluss der Paracentese beeinflussen muss.

3. Die Sclerotomie, ihrer Eigenschaft als Filtrationsnarbe entkleidet, wirkt demnach nur, wie eine Paracentese bei gleicher Wundweite.

Alle gegen letztere durch die klinische Erfahrung befestigten Einwände, müssen daher auch für erstere in Kraft und Geltung bestehen bleiben.

DISCUSSION.

Mr. Power, London: I have practised iridectomy very frequently; Hancock's operation, or cyclotomy, in a large number of cases, and sclerotomy in a few. I think that in acute cases of glaucoma, any mode of opening the eye and allowing the escape of the contents would afford relief; in cases of subacute glaucoma I prefer to do iridectomy; in cases of chronic glaucoma no operation is of much service. My objection to sclerotomy is the protrusion of the iris, which is more unsightly than a well-performed iridectomy, and much more dangerous. No operation should be performed in glaucoma hæmorrhagicum, nor in the glaucoma of young people.

Professor Panas, Paris: Admitting that the immediately favourable effect of sclerotomy is undoubted, the same is true of simple paracentesis, of Hancock's operation, or, indeed, of any procedure in which the capsule of the eye is opened. The effect, in such cases, is analogous to that of incising a whitlow or puncturing the tunica vaginalis in orchitis. But what we really want is to know how long the effect of sclerotomy will last, whether it has a really curative effect when performed once or more on the same eye. The statistics necessary to clear up this point have not yet been forthcoming. It would be needful to know, not only the cases where the disease has been cured, as in one or two which I could quote, for six or twelve months; but the number in which only a fleeting success is obtained. From the clinical point of view, as between sclerotomy and iridectomy, the question is, not whether or no the scar allows of filtration, or whether glaucoma does or does not depend upon obstruction at the periphery of the anterior chamber; but whether statistics will show that sclerotomy yields the same permanently curative results as, by universal consent, are obtained under iridectomy.

Dr. Argyll Robertson, Edinburgh: About six years ago I introduced an operation for the reduction of increased intra-ocular tension, which I termed "trephining the sclerotic." As indicated when first described, the operation is only to be had recourse to in those cases where an iridectomy is inadmissible, or where the disease has progressed, notwithstanding the performance of an iridectomy. I have, therefore, only employed the operation in a few cases, and only those of a bad type. In patients in whom there was a good hope of restoration of useful vision, I always prefer to do an iridectomy, as it is a much less dangerous operation than trephining the sclerotic, this latter being apt to be followed by intra-ocular hæmorrhage. In the first cases in which I operated, I perforated both the sclerotic and choroid with the trephine, but, latterly, I have modified the operation by merely removing a disc of sclerotic, at the distance of about three lines from the margin of the cornea, and then puncturing the choroid and retina so as to allow a little vitreous humour to escape. The sclerotic removed is replaced by new tissue, which permits the more ready transudation of fluid than the original sclerotic tissue, and which

may, under the influence of increased intra-ocular pressure be projected forwards, thus acting the part of a safety valve and relieving the more important parts of the eye from the evil effects of pressure. In one case, in which both eyes were affected with marked glaucoma, and in which I iridectomised the better eye and trephined the sclerotic in the worse, vision eventually became entirely lost in the iridectomised eye, while useful vision was retained in the other. In conclusion, in most cases I first employ iridectomy, and when that proves insufficient, I either perform sclerotomy (with the view of getting a "cystoid cicatrix," which very much corresponds to Mr. Bader's "staphyloma of the conjunctiva"), or I trephine the sclerotic.

Dr. SAMELSOHN, Cologne, agreed with Prof. Schoeler's theory of sclerotomy. In an eye on which sclerotomy had been done five weeks before, he found, on microscopical examination, that Fontana's canal, although not entered by the knife, had been enlarged, proving, he thought, that the efficacy of the operation could not depend on the canal being directly opened by the knife.

Dr. KNAPP, New York: I have practised sclerotomy for chronic and subacute glaucoma exclusively for the last eighteen months. I have, thus far, escaped the dangers of what is called malignant glaucoma after operation. But I cannot consider sclerotomy as being entirely innocent; for an eye, suffering from hæmorrhagic glaucoma, was destroyed by suppurative iridochoroiditis following upon the operation. As to the value of sclerotomy, I concur with Dr. Panas, that extensive and long-continued statistics are required, and in this connection I desire to draw the attention of the profession to the fact that there are cases of chronic glaucoma which become stationary. I, therefore, make the indications for the operation of chronic glaucoma dependent upon its progressiveness.

Mr. G. E. WALKER, Liverpool: In order to avoid the danger of prolapse of the uvea incidental to Hancock's operation, ten years ago I devised the operation which I have termed hyposcleral cyclotomy, and which consists of the division of the whole ciliary body, without division of the sclera. I claim that, with the smallest extent of wound, as much good is done by it as by either iridectomy or sclerotomy, without the danger of loss of the eye by hæmorrhage or other serious complications.

Dr. GALEZOWSKI, Paris: I accept completely Dr. de Wecker's conclusions as to sclerotomy. I agree with Dr. Panas as to the importance of knowing how long the effects of the operation last. Several conclusive cases might be cited: (1) A case of glaucoma simplex cured by sclerotomy for two years; (2) Two cases of hæmorrhagic glaucoma, in one of which the cure had lasted since October, 1880, and in the other the operation had been successful for a year, when enucleation became necessary. I think it very important to prevent any prolapse of the iris in the operation of sclerotomy. I confirm Dr. Samelsohn's observation that the anterior chamber and angle of filtration are more enlarged at the seat of the sclerotomy than elsewhere. It was for this reason that I prefer to make two scleral incisions diametrically opposite to each other. I make them three or four mm. from the corneal border, using a knife like Critchett's knife for iridodesis, but three times as large, and curved on the flat. The incisions made at the opposite ends of the same diameter are each five or six mm. long. In this operation I never get hernia of iris.

Dr. DE WECKER, Paris, replying, said: I do not contest Dr. Schoeler's sions from his experiments; but I would allude to the discovery of Ulrich, nutritive current passes through the base of the iris, and not between the lens, on its way to the peri-corneal filtration zone. Wherever this path is bl apposition of the iris to the periphery of the cornea filtration is stopped, a by Weber and Knies. In sclerotomy performed on domestic animals, par upon rabbits, this arrest occurs in consequence of the adhesion of the iri periphery of the cornea, and hence in them the formation of a true filtra by this operation is prevented. In reference to Mr. Bader's communicatio say that, for my own part, I am very strongly opposed to any prolapse of much so, that if, in spite of the action of myotics, the pupil becomes after sclerotomy, I always remove the iris through the scleral incision, co the operation into an iridectomy. I agree entirely with the remarks of Dr and Galezowski, in regard to the importance of statistics, and would refer of my pupil—Manolescu. I may here mention that I have performed sc on six medical men, some of them as much as three years ago; and that th carefully tested by the patients have remained satisfactory. Although I h sclerotomy on hundreds of patients, I have never yet seen the disastro which Dr. Knapp has mentioned. Once I saw abundant hæmorrha sclerotomy, in a young medical man, but it disappeared after several week due to the patient's imprudence in returning to his work the day operation; but, nevertheless, he escaped with V. ½ in the operated eye.

Ein neues Operationsverfahren zur Heilung der Pt

Dr. HERMANN PAGENSTECHER, Wiesbaden.

Die bisherigen Operationsmethoden, die man zur Heilung der Ptosis—ic hier von vollständiger oder doch fast vollständiger Ptosis, also Fälle, in Function des Levator ganz oder doch nahezu ganz aufgehoben ist angew leiden an zwei grossen Uebelständen, entweder leisten sie zu wenig ode Die Excision einer Hautfalte wird nur dann von Erfolg sein können, we grosser Ausdehnung vorgenommen wird und dann hindert sie auf der and wieder den vollkommenen Lidschluss; fällt dieselbe zu klein aus, so ist d tion eben ohne Erfolg. Nur bei partieller Ptosis, also Fälle in denen gewisse Function des Levator bestand, hatte diese Methode, sowie v. Gräfe angegebene—Excision eines 8—10 Mm. breiten Streifen aus dem orbicularis noch Erfolg aufzuweisen.

Ich habe in letzterer Zeit folgendes Verfahren in Anwendung gezo Princip desselben beruht darauf, die Wirkung des musculus frontalis dire obere Lid zu übertragen und somit den Levator selbst durch den fro ersetzen. Ich wurde zu dieser Idee durch die einfache Betrachtung vo Kranken hingeleitet. Ich bemerkte nämlich, dass in der Ruhestellung b gradeaus der arcus superciliaris der erkrankten Seite gewöhnlich be höher stand als der der anderen Seite; ein Umstand der durch das fort Bestreben des Patienten das Lid zu heben und die dadurch zu Hilfe ge Contraction des frontalis hervorgerufen wird. In der Regel leistet nun d traction des frontalis so gut wie nichts, da keine Faserzüge sich von da dem oberen Lide erstrecken und auch die durch den frontalis bewirkte

bung der Haut nur ganz minimal oder garnicht auf das obere Lid ihre Wirkung entfaltet. Ich kam desshalb auf den Gedanken das obere Lid mit dem Frontalis in eine directere Verbindung zu setzen und erreichte dies auch in der Weise, dass ich einen oberflächlichen Narbenstrang herstellte, der die Wirkung des frontalis direct auf das Lid resp. den Lidrand übertrug. Ungefähr einen Finger breit über der Mitte des Arcus superciliaris steche ich eine mit einem dicken Faden versehene Nadel ein, führe dieselbe unter der Haut weiter und steche ungefähr in der Mitte des oberen Lides gerade am Cilienrand wieder aus, schürze dann einen Knoten, den ich nur mässig anziehe, liegen lasse, und nach und nach durch täglich stärkeres Anziehen durch die Haut durchschneiden lasse. Die Reactionserscheinungen sind verhältnissmässig sehr geringe. Die Entstellung durch die Narbe ist eine minimale und wird schon cosmetisch reichlich aufgewogen durch das Wegfallen der Ptosis.

In den Fällen, die ich bis jetzt operirt habe genügte immer eine Sutur; dieselbe hatte eine etwas wenig schief von unten und innen nach oben und aussen verlaufende Richtung, da nämlich der Einsichtspunkt etwas nach aussen von der Mitte (circa 2 Mm.) gefallen war. Es mag auch Fälle geben, in denen es indicirt ist zwei Suturen in mässigem Abstande von einander anzulegen, und in denen es auch nicht nöthig ist die Sutur bis zum Cilienrande durchzuführen es vielmehr genügt dieselbe schon etwa in der Mitte des oberen Lides auszustechen. Auch bei incompleter Ptosis würde ich dieses Verfahren allen übrigen Operationsmethoden vorziehen, doch in etwas modificirter Form. Da nämlich in solchen Fällen ein dicker stark wirkender Narbenstrang nicht nöthig ist, so rathe ich die Narbe subcutan anzulegen und zwar in folgender Weise. Erforderlich ist hierzu eine mit 2 Nadeln versehene Sutur. Die eine Nadel wird 1 bis 2 Mm. parallel und nahe dem Cilienrand unter der Haut des oberen Lides hergeführt; genau an dem Ausstichspunkt wird dann dieselbe Nadel wieder eingestochen und zwar in der Richtung nach oben oberhalb des Tarsus unter der Haut weitergeführt und etwa einen Fingerbreit über der Mitte des Acus superciliaris wieder ausgestochen; darauf wird die zweite Nadel am Einstichspunkt der ersten Nadel auch in der Richtung nach oben geführt und am zweiten Ausstichspunkt (also oberhalb des Arcus superciliaris) der ersten Nadel ausgestochen, die beiden Fäden werden dann nur mässig angezogen und geschlungen. Man erhält hierdurch eine vollkommen subcutan liegende Naht, die man kürzere oder längere Zeit liegen lassen, ja in extremen Fällen ganz durchschneiden lassen kann und erzeugt damit einen subcutanen Narbenstrang der immer die Wirkung des frontalis auf das obere Lid übertragen muss. In welchem Falle die ersterwähnte oder die soeben beschriebene Modification anzuwenden ist, darüber lassen sich ganz bestimmte Angaben schwer machen, es muss dies dem Takte des jeweiligen Operateurs überlassen bleiben; ebenso wie lange die subcutanen Suturen liegen müssen und in welchen Fällen man dieselben wird ganz durchschneiden lassen.

Es bedarf wohl kaum der Erwähnung, dass man beim Ein- oder Ausstechen der Nadeln oberhalb des Arcus superciliaris nicht zu tief etwa bis ins Periost eingehen darf, denn sonst könnte man Gefahr laufen, dass die Verschiebbarkeit der Narbe vermittelst des frontalis durch Verwachsung der Haut mit dem Periost stark beeinträchtigt resp. ganz aufgehoben werden würde.

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Nouvelles Applications du Fer Rouge en Chirurgie Oculaire et de quesques Modifications Apportées aux Galvano-Cautères.

Dr. G. Martin, Bordeaux.

Depuis que de nombreuses observations ont démontré les heureux effets de la cautérisation ignée sur les phlyctènes kératiques et conjonctivales, et l'efficacité de ce traitement dans les abcès et ulcères de la cornée, le champ d'action du fer rouge a gagné du terrain dans la pratique opthalmologique.

La parfaite innocuité de cet agent, même dans les cas où il fallait pour arriver à guérison transpercer de part en part la cornée nécrosée, a conduit les opérateurs à généraliser son emploi.

En 1879, Pr. Gayet (de Lyon) a érigé en méthode la transfixion ignée de la cornée dans le kératocône.

Au commencement de cette année, dans un article publié dans des *Annales d'Oculistique*, nous avons montré les avantages (au point de vue d'une guérison définitive) qu'il était permis d'attendre de la destruction par le feu, des lamelles superficielles de la cornée envahies par un ptérygion.

A la même époque, il nous est venu à l'esprit de nous servir du cautère actuel dans d'autres affections et sur d'autres membranes du globe oculaire.

Le tissu de l'iris, hernié consécutivement à un traumatisme accidentel ou chirurgical, a été un de ceux que nous avons détruit par l'ignipuncture pour mettre fin à des étranglements douloureux.

Nous avons également transpercé la sclérotique au niveau de staphylômes antérieures, et cela avec quelques avantages et sans engendrer de réaction. En outre, nous avons perforé cette membrane dans un cas de décollement de la rétine. Dans ce fait notre intervention n'a eu aucun résultat visuel. Ce n'était pas du reste, ce que nous avions cherché. Une première tentative de cette nature ne pouvait être faite que sur un œil gravement compromis. Avant de prouver l'utilité de la méthode, il fallait établir son innocuité. A l'heure actuelle, sachant la ponction ignée de la sclérotique parfaitement tolérée par l'organe, il est permis de fonder des espérances sur cette pratique. En outre de la persistance de la fistule qui permettra l'écoulement du liquide sous-rétinien au fur et à mesure de sa production, il y a lieu d'espérer que l'irritation provoquée dans les tissus environnants conduira à un processus adhésif.

Toutes ces nouvelles applications du fer rouge nécessitaient des instruments plus parfaits que ceux dont nous disposions.

Le stylet que l'on chauffe à une lampe à alcool perd trop vite son calorique. Le plus petit modèle des cautères Paquelin est encore trop volumineux pour pratiquer des transfixions. Les cautères de platine qui accompagnent la pile secondaire Planté à laquelle Trouvé (de Paris) a annexé un rhéostat pour graduer le degré de chaleur sont doublement défectueux. La tige de platine est trop fine et n'offre pas, une fois rougie, assez de rigidité; d'un autre côté, cette tige longue de plus d'un centimètre, constitue un foyer d'incandescence trop étendue qui effraie le patient et gêne l'opérateur.

Pour remédier à ces deux imperfections nous avons fait fabriquer par M. Trouvé de petits cautères dont les tiges d'argent vont en s'amincissant et sont réunies par une toute petite pointe de platine de deux millimètres de longueur. Pour cautériser en surface, au lieu de cette pointe, les tiges d'argent reçoivent un arc de platine à foyer très-limité.

Ces instruments ont un si faible rayonnement qu'on peut sans crainte de mortifier la peau, brûler les poils du dos de la main ; en outre, leurs tiges d'argent s'échauffent assez lentement de la sorte qu'il est possible de les tenir entre les doigts pendant plusieurs secondes, à 6 ou 7 millimètres de leur pointe.

Une fois en possession de ces cautères nous nous sommes demandé si l'on ne pourrait pas les introduire dans l'intérieur du globe de l'œil pour pratiquer du côté de l'iris une ouverture centrale dans les cas d'occlusion de la pupille, à la suite d'extraction de cataracte, lorsqu'il existe d'épaises masses exsudatives qui résistent aux divers procédés d'irito-ectomie.

Les expériences que nous avons instituées sur les animaux ne nous permettent pas de considérer le problème comme résolu. Plusieurs inconnus subsistent encore. Mais par les résultats obtenus nous pouvons d'ores et déjà affirmer :—

1°. Que la destruction du centre de l'iris peut s'effectuer sans que le collet de l'instrument altère la structure de la cornée au niveau de l'incision faite pour lui donner passage, l'instrument n'étant allumé qu'après avoir pénétré dans la chambre antérieure ;

2°. Que la cornée ne se trouve pas atteinte par le rayonnement calorique pendant que le cautère incandescent traverse le septum iridien, pourvu qu'on prenne soin de déprimer fortement en arrière cette membrane ;

3°. Que la cautérisation de l'iris n'est pas suivie de réaction ;

4°. Que le corps vitré supporte parfaitement le contact du fer rouge.

La possibilité d'allumer les galvano-cautères une fois introduits dans l'intérieur des tissus et le peu de calorique que possèdent nos modèles au niveau de leur collet, nous ont porté à quelques applications cliniques du côté des annexes de l'œil. Plusieurs fois nous avons fait pénétrer nos nouveaux cautères dans l'intérieur de kystes palpébraux après avoir vidé leur contenu, et cela sans produire la moindre eschare au niveau de l'ouverture qui leur livrait passage. Nous avons pu également les introduire au travers des points et conduits lacrymaux presque dans l'intérieur du sac pour modifier ses parois dans des cas de dacryocystite.

DISCUSSION.

Dr. DE WECKER (Paris) had lately perforated the sclerotic in cases of detached retina with a platinum wire made red-hot, with the double object of preventing bleeding and obtaining a persistent opening. No reaction followed the operation.

On Oculo-Neural Reflex Irritation.

Dr. GEORGE T. STEVENS, Albany, New York.

Among important causes of functional nervous affections recognized by the best authorities on such subjects are—1. Various irritations, from whatever cause, of peripheral nerves. 2. A predisposition on the part of the subjects of such affections.

While other causes, such as a change in the quality or quantity of blood, or some general disturbance of nutrition, play their part in the production of functional nervous disturbance, the two first mentioned are doubtless admitted to be pre-eminent. It follows that it is of supreme importance to determine, as far as possible, all sources of such peripheral irritations and of such predisposition to nervous affections. It is nevertheless true that because of the frequent obscurity of the irritating or of the predisposing cause, functional nervous diseases are for the most part treated empirically, and the immediate or remote cause of the neuralgia, the chorea, or other affection, is

wont to receive by far too little attention or effort to ascertain its exac
Should the inherent predisposing tendency to neuroses, and the irritating
starting from a certain part of the nervous system, be found to be frequently a
and should we be able to locate a very important source of both immediate
disposing influence, to which too little attention has been directed, the obje
brief paper will be accomplished.

It is a principle generally admitted that an irritation of a nerve may ir
turbance in the functions of other nerves, even at a distance from the nerve
and also that the same kind of excitation in the same nerve may, under
circumstances, induce widely different effects in distant parts. A distinguis
President of this Congress (Dr. Brown-Séquard) has stated this principle as
—"The same peripheric cause of irritation, acting on the same centripetal n
produce the greatest variety of effects, including every functional nervous a
disorder." Keeping this principle in view, let us inquire whether the eyes ca
a source of reflex irritation; and, if so, whether they can be regarded as a
source of nervous disorders, and as a reason for an inherited tendency to such

Severe injuries to the ciliary region of the eye, or a grave disease wh
cicatricial degeneration of the front of the organ, so frequently induces se
phenomena in the uninjured eye, that it is now universally conceded that suc
and diseased eyes must be sacrificed as a defence against reflex or sympathe
in the remaining eye.* But if an injured eye can set up a sympathetic
which may be fatal to an uninjured one, then, if the principle above stated
the same kind of irritation, originating in an injured or degenerated eye, may
rise to disturbances in distant organs—for instance, the heart, the kidney
muscles of the extremities. As a partial reply to this reasonable
I refer to two cases reported by myself, more than a year ago, in the
and Neurologist, published in St. Louis, bearing precisely upon this p
the first instance, a girl, æt. 13, had, five years previous to her visit to r
a point of scissors into one of her eyes, and was brought to me suffering f
pathetic irritation of the other eye. Between the date of the injury and
she had suffered from violent headaches, attacks of intense suffering in th
probably neuralgia, and from what proved to be of greatest interest, a sever
diabetes insipidus. This disease had run a uniform course, and the quantity
passed daily had been astonishing. Removal of the injured eye was follo
immediate and surprising reduction in the amount of urine passed. Althoug
nearly four years since the operation, there has been no serious return of t
trouble or of the intense neuralgic affections. In the second case a child, w
prominent staphyloma, was also an epileptic suffering from fits occurring fr
two or three days to once in a month, and, like the girl in the preceding case,
diabetes insipidus. The deformed eye was removed, and from the time of th
more than three years ago the child had not, at a recent date when I saw him,
single convulsion, nor has he had any further trouble from the diabetic affectio
other similar cases have come under my observation. These cases are su
show that reflex irritation not only may, but does, extend from the nerves
injured eyes to remote parts. Can difficulties in the function of accommod
the proper adjustment of visual lines also produce reflex symptoms in other p
body. We must admit that as refractive errors and muscular insufficiencies
do induce asthenopia, which is expressed, not usually in the eye itself, but i
roundings, then the same causes may react upon more distant parts.

Time does not permit an elaborate recital of the manner in which such
nor of the special forms of nervous disturbance most frequently observed as

* Does the author refer to sympathetic irritation or to true sympathetic infl
—EDS.

from causes which would produce asthenopia; but the results of observations in several hundred carefully recorded cases of such diseases as neuralgia, chorea, insomnia, headaches, and even epilepsy, have fully confirmed the opinions long since expressed by me, that difficulties in performing the function of sight are among the prolific sources of functional nervous disease. I have at various times reported many instances* illustrating this fact. I will now add but a single illustration of the practical value of the principle.

Mr. F. S. H., aged thirty-two, consulted me at the request of his attending physician, Dr. Wm. H. Robb, March 12, 1880. He was apparently robust, but was, as he informed me, an epileptic. His epileptic attacks commenced eight years previous to this visit, and had occurred with regularity except during a short time in the year 1877. The fits occurred once in about two weeks, severe attacks usually alternating with milder ones. The patient was subject to constant headaches in the temples and brows, and had habitual pain in the lumbar region. For many years previous to the epileptic disease he had been subject to most violent attacks of sick headaches, but these had, in a measure, been replaced by the epileptic fits. He was excessively nervous and restless, and habitually rose from his bed to walk the floor at night. He had always been constipated, a condition from which his only relief had been the daily use of cathartics. I could detect no cause for all this nervousness, except in the condition of the eyes. There was found insufficiency of the external recti muscles of 2° at twenty feet. There was no apparent strabismus. A partial tenotomy of one of the internal recti muscles was made with great care, and he was found immediately to have ability to overcome a prism of ten degrees with the external recti muscles, while his converging ability remained unimpaired. A few days after the operation he expressed the greatest satisfaction at what he considered a radical change in his whole condition. He was already free from headache, his nervousness had disappeared, and his sleep was better than for years. A year and a half has passed; and in a letter written to me a short time since, he says: "I feel that I am perfectly well." He takes no more cathartics, has no headaches, rests well at night, and has had three attacks of *petit mal*. A great many cases might be adduced to show that refractive errors and muscular insufficiencies are prolific sources of sick headaches, neuralgias, chorea, hysteria, and other nervous disorders; but I need only refer, in confirmation, to cases already published.

If it be admitted that difficulties of refraction and of association of visual lines may be important causes in producing nervous affections, we have then a rational explanation in many cases of the hereditary tendency to such complaints; for if neuralgia, headaches, chorea, and other forms of nervous disorders may be caused, for instance, by hypermetropia, then we may readily see why the children of a hypermetrope who has suffered, perchance, from one of these disorders, may be affected, not necessarily with the same form of disease, but with one of the forms likely to be produced by hypermetropia. For while it is not at all probable that neuralgia is of itself an inherited condition, we know that hypermetropia is directly inherited. Now, if it has caused neuralgia in the mother, it may also cause it or some other nervous affection in the child. Thus, while it is illogical to regard chorea as a direct heritage from neuralgia, it is logical to suppose that the same physical characteristic may induce the one or the other.

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* See "Transactions of the Albany Institute, 1874, 1875." "Chorea," "Transactions of New York Academy of Medicine," 1876. "Refractive Lesions and Functional Nervous Diseases," *New York Medical Record*, September, 1876. "Light in some of its Relations to Disease," *New York Medical Journal*, June, 1877. "Relations between Corneal Diseases and Refractive Lesions of the Eye" International Medical Congress, Philadelphia, 1879. "Two Cases of Enucleation of the Eyeball," *Alienist and Neurologist*, January, 1880. "Ocular Muscular Defects and Nervous Troubles," "Transactions of New York State Medical Society," 1880.

During several years I have kept a areful record of the family histories of the s of my private patients who have refractive and muscular troubles of the eyes, and that no one can look over those records without being convinced that muc mystery of inheritance in disease is explained by the fact of the inherited physi of the eyes and physical proportion of the ocular muscles.

After several years of careful consideration of this subject I am led to the fo conclusions :—1. That among the peripheric influences which generate nervo tions, the irritation arising from a perplexity or exhaustion of nerves in pe the functions of adjustments of the eyes must be regarded as of great impor 2. That when a family tendency to neurotic affections is found, the inherited f is often transmitted in the form and condition of the eyes —3. That inveter of nervous disease not amenable to other forms of treatment will often yield r the simple process of relieving the eyes from muscular or refractive disabilities.

Relation entre le Kyste séreux sous-palpébral de l'orbite microphtalmos et le coloboma de l'œil.

Dr. Van Duyse, Ghent.

Le Dr. Talko de Varsovie a présenté à la dernière réunion de Heidelb qu'au Congrés de Milan une observation de kyste séreux congénital de avec microphtalmos.

Je vous demande la permission d'exposer un cas semblable en formu déduction que justifient quelques unes de ses particularités.

Il se rapporte à un jeune homme de 22 ans, dont l'œil gauche microph présente un colobome de l'iris, de la choroïde, de la couche pigmentaire de et de la gaîne du nerf optique. Les symptômes fonctionnels de ce micro avec colobome sont l'amblyopie, la myopie axile, le nystagmus et le r ment du champ visuel à sa partie supérieure.

A droite existe un kyste fluctuant repoussant la paupière inférieur ment ectropionnée) en avant et en haut.

L'exploration de l'œil avant la ponction de cette tumeur élastique laiss à un kyste séreux sous-palpébral avec anophtalmos comme de Wecker l'ont décrit.

Le liquide—très-riche en albumine et en chlorures—une fois extrait de par aspiration (analyse chimique et histologique), le kyste s'affaissa et ainsi un microphtalmos primitivement caché par un repli de la conjonctive

Comme le relation entre le kyste et l'œil était fort directe, je n'hésite p dans ce cas un microphtalmos avec coloboma enkysté en m'appuyant, d vue, d'analyses anatomiques que nous ont léguées plusieurs auteurs et qui trent qu'à une certaine période de la vie intra-utérine le plancher ocula bomateux s'est ectasié, enkysté, développé ne laissant l'œil ébauché qu d'appendice tout-à-fait secondaire.

Arguments.

1.—Dans la collection anatomo-pathologique du Prof. O. Becker à H existent deux specimens de microphtalmos avec kystes adjacents au oculaire, recueillis chez un jeune enfant dont le père présentait un colobo gaîne du nerf optique.

2.—Nous connaissons de longue date des observations de microphtalmos avec colobome où ce dernier était devenu fortement staphylomateux ou dégénérait en une vésicule énorme. Arlt a décrit un microphtalmos très-prononcé avec kyste repoussant les paupières inférieures et contenant du liquide albumineux.

3.—Wallman a vu chez un enfant un œil microphtalmique présentant un colobome de l'iris. Le petit œil n'était séparé d'un kyste sous-jacent que par un cordon solide et la vésicule était tapissée à l'intérieur d'une portion de rétine et de choroïde.

Dans un second cas la vésicule communiquait directement avec l'œil microphtalmique et présentait également une portion de rétine et de choroïde à sa face interne.

Les seules observations qui semblent se rapporter à la variété de kystes congénitaux de l'orbite décrits ici sont celles qui appartiennent à Talko, de Wecker, Wicherkiewicz et probablement une observation de Berlin.

L'absence de l'œil dans quelques uns des cas qui ont été décrits peut s'expliquer par l'état de réplétion de la tumeur empêchant un examen convenable ou par l'état très-rudimentaire de l'œil.

Il convient de distinguer les kystes de cette espèce: (*a*) de l'encéphalocèle, où l'examen chimique tranche immédiatement la question:—(*b*) des kystes dermoïdes à contenu fort liquide, nés aux dépens du feuillet externe du blastoderme et en rapport direct avec l'œil (Manz, Chlapowski) ainsi que de la variété dont l'origine a été rapporté au développement branchial (kystes branchiaux de Cusset). (*c*) enfin des hauts degrés de dégénérescence du bulbe fœtal.

Contrairement à une donnée de Talko nous pouvons conclure des faits exposés ici à une liaison génétique entre le kyste séreux intra-orbitaire, sous-palpébral et l'œil lui-même.

Injuries to the Optic Nerve and Ophthalmic Artery from Fracture of the Optic Canal.

Dr. R. Berlin, Stuttgart.

It has only lately been shown (von Hölder) that fracture of the optic canal is very frequent in fractures of the base of the skull, and the author assumes that sudden single amaurosis, following immediately after injuries to the head, is usually due to this condition.

Hitherto there has been scarcely any post-mortem proof of the character of the injury to the nerve. The author details (1) a case of gunshot injury, in which there was a fissure-fracture of the whole length of the roof of the canal, with laceration of the nerve in the canal and within the skull as far as the chiasma; the laceration was chiefly in the axis of the nerve; the corresponding nerve fibres were disintegrated and bloodstained (but there was no blood either in the nerve or in its sheath); (2) Fissure-fracture through both optic foramina, both nerve sheaths filled with blood, and one nerve and its artery torn across; (3) Three cases of laceration of the internal carotid artery, in one of which both optic canals were fractured, and the optic nerves torn across between the foramen and the chiasma.

Transplantation des Muqueuses sur l'œil.

Dr. Dufour, Lausanne.

Résumé les observations qu'il a pu faire jusqu'ici sur la transplantation des muqueuses à la place de la conjonctive—

Les opérations de transplantation complète sont au nombre de quatre.

Deux fois il transplanta la conjonctive du lapin a l'homme, et deux fois la muqueuse buccale du malade lui-même.

1er Cas.—Vieille femme; grande lacune de la conjunctiva bulbi par l'excision d'une cicatrice adhérente à la paupière; transplantation du lapin, 1 centimètre carré a peu près. Le morceau à transplanter est d'abord détaché du lapin, puis cousu par cinq fils de soie sur le bulbe de la malade.

Insuccès. Le troisième jour le lambeau conjonctival est nécrosé et tombe. Le résultat facheux est dû :—

(*a*) A l'âge avancée de la malade.

(*b*) A la place où il a fallu transplanter; savoir, la surface du bulbe, moins vascularisée et plus exposée aux déplacements venant des mouvements de la paupière.

(*c*) A l'usage des fils de soie.

(*d*) Au fait que dans la suture la pénétration de chaque fil entraînait une plissement du lambeau à transplanter.

2me Cas.—Un garçon de 8 ans, grand symblepheron, suite d'une large brûlure à le chaux, et de deux opérations non réussies. Adhérence absolue de la paupière inférieure au bulbe et aux deux-tiers inférieurs de la cornée.

Transplantation de conjonctive du lapin; on prend sur le lapin environ 3 centimètres de conjonctive, qui sont circonscrits par six sutures de catgut; chaque fil portait son aiguille placée d'abord sur le lapin.

Après avoir préparé l'œil de l'enfant, on excise le lambeau circonscrit sur le lapin, et on le transporte sur la vapeur d'eau chaude, à l'enfant, où il est cousu. Opération facile. Résultat excellent. Quatre jours après le lambeau était fixe. Deux mois ensuite on voyait encore dans le sac libre le morceau transplanté, couleur normale, mais encore insensible au toucher.

3me Cas.—Un homme, 60 ans, à la suite de trois opérations plastiques pour enlever un cancroïde grave de deux paupières gauches avait gardé un ankyloblepheron laissant une fente de 4 mm. seulement. Vision normale de cet œil, mais impossible à cause des paupières. L'autre œil perdu par décollement de la rétine. La conjonctive a dû être enlevée jusqu'à 2 mm. de la cornée pour participation au néoplasme.

Ouverture de la commissure externe, jusqu'à son élargissement normal.

On recouvre cette partie de muqueuse prise à la bouche. Le malade a un lipôme sous-muqueux derrière la lèvre. On entoure le lipôme avec des sutures. Détachement du lipôme. Préparation de la muqueuse sur la vapeur d'eau. Transport et fixation à l'œil. Durée de la suture environ 16 minutes. La muqueuse qui était rouge devient rapidement pâle, puis blanche, puis grise, et à la fin de l'opération elle ressemble à du papier gris. Surface transportée environ 6 centimètres carrés.

Issue.—Les deux-tiers internes du lambeau transplanté qui correspondaient à l'ancienne conjonctive, ont très-bien vécu, surtout tout ce qui tapisse le bulbe. Le tiers extérieur correspondant à la peau s'est nécrosé. Il se forme une excellente

commissure, et le malade peut ouvrir son œil. Il n'est gêné que par la paresse de la paupière qui est formée de peau temporale.

4me Cas.—Semblable au troisième, seulement on prend à la lèvre de la muqueuse sur un point normal. Issue bonne. Quant au mode opératoire je recommande de circonscrire d'abord au couteau le lambeau à transporter; puis y fixer les sutures en faisant sortir l'aiguille par la plaie dessinée. Puis prendre le faisceau de fils, attirer doucement le lambeau, le détacher avec soin, et le transporter sur la vapeur jusqu'au point où on veut le fixer.

Prendre garde que toute hémorrhagie soit absolument arrêtée à la surface sur laquelle on veut transplanter.

Comme on le voit, une muqueuse devenue toute grise, et d'apparence mortifiée, peut encore prendre pied. Le pansement a été fait à l'acide salicylique.

On Tuberculous Inflammations of the Eyeball.

Prof. J. Hirschberg, Berlin.

Scrofulous or strumous inflammations of the eyeball were very well known and often discussed in the first and second halves of this century. Tuberculous inflammations were formerly often diagnosed, sometimes without reason; then, during the first part of the ophthalmoscopic era, called in question; and, finally, corroborated by the minutest histological researches.

The histological character of the tubercle was believed to be very different in the three parts of our century; Laennec having especially accentuated the caseous matter of tuberculous products; Lebert insisted upon the peculiar corpuscle of the tuberculous growth—a shrunken cell; Virchow upon the elementary greyish tubercle, a conglomeration of round lymphatic cells, with tendency to necrobiosis; Schüppel, Wagner, Friedlaender, and others of later times upon the giant cells, with a surrounding network filled with little cells.

But, as these giant cells are met with in very various products of very different diseases, for instance, syphilis, lupus, simple granulations, it is paradoxical, but nevertheless true, that the histological diagnosis seems to be to-day almost more difficult even than the clinical diagnosis; and some authors, as Cohnheim, require a physiological proof of a true tuberculous product; tuberculous matter being that which may produce (in a living animal) a tuberculous infection. Notwithstanding, I believe (with others) that it is possible to make a trustworthy histological diagnosis of tuberculous product, if we find a granular tissue with giant cells and a surrounding network, and with a large quantity of dead caseous matter.

I now beg to narrate three different cases which I diagnosed to be true tuberculous inflammations of the eyeball; these being all that I have seen during four years, in more than seventeen thousand new eye cases.

Case 1.—Tuberculous inflammation of the conjunctiva of the eyeball. A girl, aged four, of healthy family, was admitted on July 31, 1878. Right eye normal. Left without blepharospasm, pain, or discharge, but the conjunctiva of the eyeball converted into a confluent caseous ulcer, surrounding the cornea, and from six to eight millimètres broad; downwards the caseous ulceration occupied the swollen fornix, and miliary ulcers scattered through normal tissue reached to the posterior part of the tarsal conjunctiva. Similar ulcers were present in the upper

fornix. Forwards the epibulbar ulceration reached the equator. The ca was detached from the eyeball. Between caruncle and eyeball a pocket was f with infiltrated walls, and filled with a caseous dry matter, such as is n frequently found in rabbits after operations or experiments. The edge of the was eroded, its anterior surface slightly pitted, and its parenchyma dim wi blood vessels. The child had enormous submaxillary glands on the same si left. I diagnosed a tuberculous inflammation and ulceration of the conju particularly of the eyeball; but I must confess that I had never seen a case.

Internal and topical remedies of different kinds were applied witho benefit. The cornea became partially granulated, partially ulcerated, a caseous ulcer covered the greatest part of the eye. Pain set in; the chi pale and unhealthy-looking, and the submaxillary glands increasing conside

Under these conditions, on the 27th of September, 1878, I proposed a formed excision of the eyeball. The operation was rather difficult, beca forceps did not take hold of the dry conjunctiva. The posterior half of the was found to be normal; under the caruncle was a large caseous plug tow equator. Parts of the infiltrated conjunctiva were excised at the sam Recovery took place quickly. During the first two months the conj which naturally formed a very short funnel, and did not allow an artific seemed to be a little granulated, so that I feared a relapse. But grad became smoother and smoother, like cicatricial tissue, and now it looks l The submaxillary glands shrunk rapidly after excision of the caseous p A good diet and appropriate remedies were of course ordered. The child living, two years and a half after the operation. I venture to believe that has, perhaps, preserved life in this case.

The microscope showed typical tuberculous inflammation. In transve tions, through the sclera and episcleral deposit, the deeper layers of the sc normal; upon these follows a granular round-celled tissue with giant cells; a perfectly amorphous layer of caseous matter, clearly distinguished fr living parts by modern staining (eosine).

Histologists to whom I had the opportunity of showing the prepa acknowledged that they seldom had seen a better specimen of tuberculous mation.

Case 2.—A boy, aged two years, with tuberculous inflammation of the ir under my care last year (1880). Parents healthy; four out of five broth sisters were scrofulous. The patient himself had been twice attacked by sev the last time three weeks ago. For some weeks his mother had observe left eye a greyish spot, apparently increasing during the last week.

The child was not very ill, but was evidently tortured by pains in his left ey was a decided chronic hydrocephalus. The right eye was healthy; the le and much injected around the cornea. A caseous matter filled the lateral the aqueous chamber and reached the cornea, through which ran a larg vessel of new formation. In the nasal half of the iris, there were some miliary nodules visible to the naked eye. Pupil closed by exudation. U in the sclera, near the corneal edge, was a yellowish prominence.

I diagnosed tuberculous inflammation of the iris, and proposed excisio eyeball, but yielded to the mother's urgency, to try first an evacuation of the matter. On the 11th of July, 1880, I made a section at the outer margi cornea with a keratome, and excised a piece of iris tissue; but I could not

the dry caseous matter, which was continuous, as I had suspected, with the scleral prominence. The wound healed well; but the caseous matter filled the aqueous chamber rather more than before the operation, and a granulated tissue bulged from the section. The eye was therefore enucleated on the 6th of August, 1880. The wound healed in the usual manner, and the child was evidently more comfortable.

But, on the 1st of September, the boy was attacked by fits. I saw him some ten days later; he was then lively and merry as before, but showed a slight paralysis of the left arm and leg; the fundus of the right eye was now, and continued, normal. He died, in fits, on the 16th of December, 1880, at the age of two years and a half. No post-mortem.

There was found on histological examination by Dr. Rüter, tuberculosis of the iris, beginning with little nodules, proceeding to a tuberculous infiltration of the whole iris and of the corneal wound; with also anterior and posterior synechiæ inflammation of the ciliary body, and partial opacity of the lens. The other parts of the eyeball were normal.

Tuberculous inflammation of the iris is not so rare as that of the conjunctiva, particularly if you agree with the view, advanced by some eminent authors, that the so-called granuloma of the iris is, unless it be of traumatic origin, generally a tuberculous affection. I would, however, mention the fact, without further comment, that in eyeballs, destroyed by severe injuries, and enucleated, perhaps ten weeks after, we may find microscopical structures very similar to what is now called local tuberculosis—viz., giant cells.

Case 3 was one of tuberculous choroiditis. The disease formerly described under this name had no etiological connection with tuberculosis, but was the true purulent metastatis choroiditis.

There are two different tuberculous affections of the choroid; one relatively common, the other very rare. The former is the miliary tuberculosis of the choroid, accompanying general acute tuberculosis. The latter, tuberculous inflammation of the choroid, was, prior to my own observation, only alluded to by Manfredi and Poncet, but without ophthalmoscopical examination.*

On the 21st of April, 1875, I was asked by one of my friends, Dr. Schlesinger, to see the eyes of one of his patients, a man, twenty-seven years of age, who was suffering from fever and headache, and for sixteen days had had painful inflammation of his left eyeball. The right eye was normal. The left was slightly protruding, mobility normal, the scleral conjunctiva bulging as a thick red roll. Media clear, except a very slight mistiness of the cornea, and very faint traces of exudation at the margin of the atropised pupil. The fundus presented the following peculiar appearances. No disc visible. The retinal veins enormously dilated, some of them four or six times the normal size, tortuous and accompanied by some bloodspots, the greater part of the visible retina had a very whitish colour, and was decidedly protruded by a sort of retrovascular or choroidal new formation of tissue. The eye was almost blind.

On the following day I punctured the orbit, but could not evacuate any purulent matter. On the 23rd of April an epileptic attack set in with syncope. On the 25th of April the swelling was lessened, the retinal vessels reduced to the half of their former breadth, and fingers could be counted upwards. The patient was feeling much better. But soon after the disease became worse, and the patient died comatose on the 5th of May, 1875.

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* A similar case is given by Gowers (*Medical Ophthalmoscopy*, 1879, case 5, p. 250). —Eds.

[illegible] symptoms, affecting some [illegible] by Dr Cephalos. [illegible] were always very differe[illegible] I may allude to an inte[illegible] Society of Paris, on July [illegible] tuberculosis iridis; the [illegible] Virchow's theory, believi[illegible] by general tuberculosis. [illegible] I venture to think that in [illegible] tuberculous deposit which (as in [illegible] in a person free from acu[illegible]

[illegible] *Eyes, with Deficie[illegible] [illegible] anterior part of the Choroi[illegible]*

Dr H[illegible] Rio de Janeiro.

The patient, a man aged [illegible] stated that his sight had always been de[illegible] and that shortly after birth Dr Carron du Villards had pronounced his d[illegible] be congenital. He came to me for recent muscæ.

Present condition, myopia [illegible] and constant lateral nystagmus; eyes pro[illegible] corneæ appear too flat, and anterior chambers shallow. Complete absenc[illegible] in both eyes. Lenses irregularly elliptic in outline and displaced upwards, [illegible] an aphakic space of crescent shape in the lower part; they apparently adher[illegible] sclerotic at the upper part, no space being there visible, and no movements o[illegible] by motions of the eyes; some slight superficial opacities. No signs of ciliar[illegible] [illegible] anterior parts of the choroid. Choroid in posterior

eye normal in some parts, more or less deficient in others, especially above and below; vasa vorticosa formed entirely by tributaries from posterior part of eye. A moderate posterior staphyloma on y. s. side of disc. Retinal vessels normal in distribution and extent. Visual fields slightly contracted up-, down-, and outwards. V. R. 1 Sn., and with $-\frac{1}{34} = \frac{20}{70}$ L. with same glass $-\frac{20}{100}$

The author considers that the case proves that the iris and ciliary body are developed, along with the choroid, from the outer layer of the secondary eye vesicle, and not independently of the choroid, as was supposed by some of the earlier embryologists.

Observations on a Peculiar Expression of the Eyes of the Colour-blind.

Dr. B. Joy Jeffries, Boston, U.S.A.

Professor Wilson, in his monograph on colour-blindness (1855), gives, at pp. 152 and 173, an account of "A singular expression in the eyes of certain of the colour-blind," causing "a startled expression," or an "eager aimless glance," or, in other cases, "an almost vacant stare," &c.

In my manual on "Colour-blindness: its Dangers and its Detection," p. 67, I have referred to the subject, and my present object is to supplement, by further observations, the qualified adhesion to Professor Wilson's statements which I then gave.

Since writing the above work, I have seen very many more colour-blind, and hence had further opportunity of familiarizing myself with this peculiar look, which belongs to them alone, and is not due to any ametropic condition, occurring as it does in the emmetropic. I awaited some mention of it in the several monographs which have touched on peculiarities connected with colour-blindness, but, not finding any, I called attention to it in a communication before the Boston Society of Natural History, at the meeting, Nov. 17, 1880. I would, by this brief article, draw the special attention of gentlemen who, officially or otherwise, test for chromatic defect to this peculiar look, as it cannot but exist among the now many hundred colour-blind who have been examined by competent observers, with some of whom the latter must come in frequent contact.

From my later experience I can, however, add but little to Professor Wilson's description. There is a certain liquid look in the eyes, as if slightly suffused. It gives also the colour-blind person the appearance of not listening, or not being interested in what you are saying to him. I have, as I said, detected a colour-blind person by this look, but I have also failed, being, I suppose, too anxious to find it before being sufficiently familiar with it. It has been readily recognized by intelligent bystanders to whom I pointed it out.

A lady once asked me what was the matter with Mr. A.'s eyes? Knowing he was colour-blind, I drew her on to describe what she meant, and her account was a very good repetition of Professor Wilson's above-quoted. She had never heard of this peculiar look of the colour-blind. She has since noticed and spoken to me of the same in reference to some other mutual acquaintances who are colour-blind. I can now recall this peculiar look as connected with the facial expression of a gentleman I knew for many years without detecting his chromatic defect, although the question of colour had been entered into between us. His nephews I found

colour-blind, and they told me of the ridiculous mistakes of their maternal uncle. One of these nephews told me only yesterday that he could detect no difference when the brilliant skyrocket lights changed from red to green.

This peculiar expression of the colour-blind varies in amount, and even at different times, in the same person. It, however, seems to always hover about the eyes. I cannot answer positively whether it is more apparent in those most defective. I should say that it was. In speaking before the Natural History Society last year, I said that I had not noticed it in the few colour-blind females whom I had detected. Since then I have found a very colour-blind lady in whom it exists to some degree. I probably should not have noticed it except for my considerable experience with other colour-blind. An anecdote may here help to explain the effect of this peculiar look. During my labour of testing the Boston public scholars, I was one day at a boys' school when the several classes, coming and going in the hall, made such a disturbance that the principal stepped on to the edge of the platform to stop it. He said nothing, but merely looked at the lads. I thought to myself, as I watched his face, "Well, that indefinite aimless expression and gazing into distance won't quell such turbulence." To my surprise, the noise ceased as soon as he attracted attention. Shortly after, I called him to look at the matches a colour-blind boy had made with Holmgren's test, in which he saw, as he said, nothing out of the way or to comment on. It then flashed over me that he was colour-blind, which, upon examination, proved true. His peculiar look was that of the colour-blind. I met him once afterwards, coming hastily through a door in the Post Office, when I caught his eye first, and instantly noticed the expression as that of the colour-blind before I recognized the rest of his face.

I have thus briefly called attention to this singular peculiarity, which may prove of value in the detection of colour-blindness. I would attempt no explanation of it. Ocular expression is, of course, due to the muscles of the lids and face. As these, however, are called into play from mental impressions derived through the eye, it does not seem impossible that the colour-blind eye may have its own peculiar facial expression.

De l'énucléation de l'œil dans la panophtalmie suppurative aiguë.

Dr. Daniel Molliere, Lyons.*

En 1876, j'ai publié dans le *Lyon Medical* une observation d'énucléation du globe oculaire pendant la période aiguë du phlegmon de cet organe. Je fis alors remarquer que cette opération si simple avait donné un résultat rapide et parfait. Ayant opéré d'autres malades dans ces mêmes conditions, je proposai d'ériger l'énucléation en méthode générale pour le traitement du phlegmon de l'œil (panophtalmie suppurative aiguë). Ma proposition ne fut pas alors accueillie très-favorablement et il me fut prédit que dans bien de cas j'aurais à redouter des accidents cérébraux. Et des observations antérieures me furent citées. Il faut dire qu'elles ne se rapportaient pas à des cas de phlegmon de l'œil, mais bien à des cas de phlegmon du tissu cellulaire de l'orbite. Depuis cette époque j'ai continué à pratiquer cette opération et je lui reconnais les avantages suivants :—

* Chirurgien-en-Chef de l'Hôtel Dieu de Lyon, de la Société de Chirurgie de Paris.

1° Elle fait cesser immédiatement les douleurs.

2° Le gonflement disparaît ordinairement le soir du premier jour.

3° L'ophtalmie sympathique est prévenue ou arrêtée.

4° La cavité oculaire reste libre et l'on peut dès les premiers jours faire de la prothèse oculaire tandis que lorsque l'œil s'atrophie il y a des brides cicatricielles qui la rendent impossible ou douloureuse.

Les faits que j'ai observés sont au nombre de vingt-six. Plusieurs de mes collègues des hôpitaux de Lyon ont suivi mon exemple. Les opérations qu'ils ont pratiquées dans des cas analogues quintupleraient le chiffre que je viens d'apporter. Aucun d'eux n'a observé d'accident. J'ai opéré des malades de 70 et 72 ans, de 20 et de 18 ans. Chez tous les suites ont été absolument simples.

Dans plusieurs cas le phlegmon reconnaissait pour cause une opération de cataracte.

Dans d'autres cas un traumatisme, brûlure, choc d'un épi de blé, corps étrangers.

Dans d'autres cas j'ai vu le phlegmon se développer sous l'influence de causes générales; ou sur des yeux atteints depuis longtemps d'altérations chroniques.

Malgré cette diversité dans l'étiologie j'ai toujours pu renvoyer mes malades guéris au bout d'une dixaine de jours en moyenne, même dans un cas où il y avait eu un phlegmon de l'orbite.

Je tiens à donner aujourd'hui ces résultats, car je crois avoir été le premier au moins en France, à dire, que l'énucléation du globe oculaire pendant la période aiguë doit être le traitement de tous les cas de panophtalmie suppurative.

Description of a Registering Perimeter.

Dr. George T. Stevens, Albany, New York.

Fixed to a standard is a ring of brass, about five inches in diameter, in which is held another ring which is movable. To the inner ring is attached a series of wheels, a rack carrying a pencil, and a bearing through which passes an arm of thin brass, about twenty-five inches in length.

This arm is bent so as to form an arc of a circle of twelve inches radius; one edge of the arm is toothed. At one extremity of the arm is a dark plate on which a steel spring is calculated to hold a small piece of white or coloured cardboard. The arm, owing to the movement of the inner ring, to which it is held by the bearing, can be set at any angle to the horizon; by turning with the ring it describes in space a hemisphere, and as it moves in a circle, the inner ring with its attachments moves with it. In front, a dark disc of sufficient size hides the working portions of the instrument from the eye to be examined. A small polished point at the centre of this disc is the point of fixation.

In practice, when the arm has been pushed along until the small piece of cardboard touches the polished point in the disc, the toothed edge of the arm has so acted upon the series of wheels as to cause the rack bearing the pencil to have also moved in such manner that the pencil is exactly opposite the central point. When the arm is moved so as to carry the dark plate (and little card) through a space of one hundred degrees, the pencil has been carried as far as the outer border of the outer ring. It will be seen that the pencil not only moves in a circle directed by

the position of the arm to the horizon, but also at different distances in the circle, depending upon the position of the arm in its bearing. The movement of the arm in its bearing is communicated by a milled head turned by the fingers. By a hinge, a tablet is attached to the upright support. Upon this tablet a printed diagram —consisting of a series of concentric rings and radiating lines—may be so placed that, when the diagram is brought into contact with the pencil, the centre of the diagram is exactly opposite the point of fixation. As the paper touches the pencil the exact position of the pencil is registered upon the diagram.

The advantages of this instrument are—(1) That it is free from the objection of the great weight and bulk which characterize all other perimeters with which I am acquainted. (2) It is more exact in its record, being automatic in its registering movements, and thus is free from the errors which are incident to observing with the eye and registering upon a detached diagram by the hand. (3) The field of vision can be determined in much less time than when the surgeon must stop to observe and then record his observations. In brief, the instrument is far more convenient, is more exact in its record, and demands much less time in its use than any other perimeter of which I have knowledge.

Dr. Elloui (Egypt) exhibited a series of microscopical preparations, which were intended to show (1) that the corneal tubes of Bowman are entirely artificial, having no relation with the inter-fascicular spaces which have been named the "lacunar and linear interspaces," which are normally nearly completely filled by the fixed corpuscles of the cornea and their protoplasmic prolongations. (2) That these prolongations anastomose and form a continuous network throughout the thickness of the cornea. (3) That there are nerve-cells uni- or bi-polar at the corneal margin, forming a true ganglionic centre for the cornea.

Chromoptomètre pour l'Examen des Employés de Chemin de Fer et des Marins.

Dr. Parinaud, Paris.

Cet instrument est à la fois un chromoptomètre et un photoptomètre.

Il permet de déterminer l'aptitude à reconnaître les signaux colorés par deux méthodes différentes, basées, l'une sur les variations d'intensité de la couleur, l'autre sur les variations de la surface ou de l'angle de vision.

A.—Dans la première méthode, la source lumineuse est représentée par l'ouverture fixe d'un diaphragme au devant duquel se trouve un verre dépoli qui diffuse la lumière. A l'aide d'une lentille positive et d'un diaphragme à ouverture variable, on donne à cette source lumineuse l'intensité que l'on désire.

Sur un second verre dépoli, placé au foyer conjugué d'une lentille par rapport au premier, on obtient une image agrandie de la source lumineuse. L'intensité de cette image est déterminée par l'ouverture d'un second diaphragme.

Si l'on place une substance colorée transparente dans un coulisse, au devant du verre dépoli antérieur, on voit, par l'ouverture d'un écran, la couleur avec une intensité proportionelle à l'ouverture du diaphragme.

L'examen se pratique à petite distance. L'intensité de la source lumineuse reglée d'avance demeurant constante, ainsi que sa distance et celle de l'examiné,

l'acuité, qui est inversement proportionnelle à l'intensité nécessaire pour que la couleur soit reconnue, sera donnée par les indications d'une règle dont les graduations correspondent à l'ouverture du diaphragme.

Les trois couleurs, rouge, vert et bleu, suffisent aux besoins de l'examen.

Les avantages de cette méthode, pour le daltonisme congénital, résultent en grande partie de ce que, en faisant varier l'intensité de chaque couleur, on enlève aux viciés leur principal élément d'appréciation.

Le diagnostic repose :—

(*a*) Sur les erreurs de dénomination à peu près constantes et qui sont d'autant plus significatives que l'examen ne porte que sur des couleurs fondamentales.

(*b*) Sur les dénominations multiples données à une même couleur suivant l'intensité.

(*c*) Sur la confusion du rouge et du vert présentés séparément ou simultanément.

(*d*) Sur la dissociation entre la sensation lumineuse et la sensation chromatique de la couleur pour laquelle il y a cécité, lorsque l'intensité augmente progressivement en partant de o. Avec un verre rouge suffisamment saturé, l'œil normal perçoit simultanément la couleur et la clarté. Le daltonien perçoit généralement la sensation lumineuse avec la même intensité que l'œil normal, tandis qu'il faut une intensité plus forte pour que la sensation chromatique vraie ou fausse se produise. Si peu prononcée que soit cette dissociation pour le rouge, elle est caractéristique. Pour le vert elle est encore plus accusée, mais elle n'a de signification qu'au delà d'une certaine intensité, parce qu'il n'est pas possible de trouver d'échantillons avec lesquels les deux sensations soient simultanées pour l'œil normal.

(*e*) Sur l'absence de sensation chromatique et lumineuse, avec le rouge saturé sous une faible intensité, chez quelques daltoniens dont le spectre est raecourci.

En ce qui concerne le daltonisme pathologique, cette méthode en rend le diagnostic facile quels qu'en soient la forme et le degré. Elle permet de découvrir et d'évaluer numériquement les plus légères altérations de la vision chromatique. Elle est particulièrement favorable pour le scotome central.

Il est une forme de dyschromatopsie, qui passe le plus souvent inaperçue, bien qu'elle réduise d'une manière considérable la faculté de distinguer les signaux de nuit et ceux de jour par un temps sombre. Elle ne peut être reconnue sûrement que par cette méthode. Ce faux daltonisme, dont j'ai donné les caractères dans une communication à la Société de Biologie de Paris (18 Juin, 1881), résulte d'un affaiblissement de la sensibilité pour la lumière qui entraîne un affaiblissement corrélatif de la sensibilité pour les couleurs. Il est compatible avec une bonne acuité visuelle.

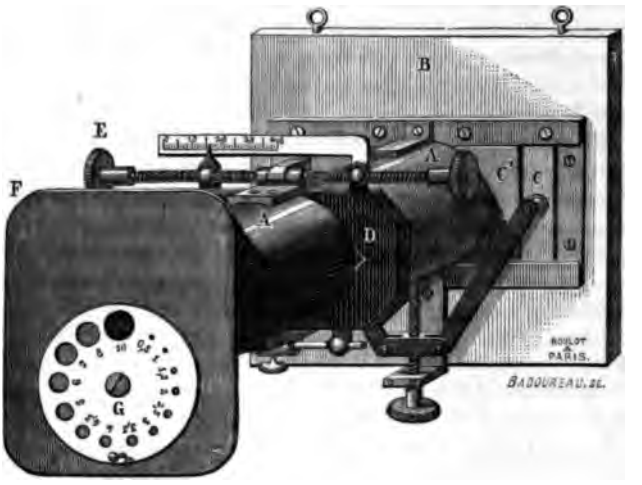
B.—Dans la seconde méthode, on se sert d'un disque rotatif percé d'ouvertures graduées par demi-millimètre du diamètre. L'examen peut se faire avec des couleurs transparentes ou opaques qui servent aux signaux de jour et de nuit. Il se pratique à la distance de 4 ou 5 mètres suivant l'étendue de la pièce.

Pour les couleurs transparentes, on règle la source lumineuse à l'aide du diaphragme postérieur, de manière que l'œil normal perçoive la couleur avec un ouverture de 1 mm., à la distance adoptée. L'acuité est inversement proportionnelle à la surface de l'ouverture nécessaire pour que la couleur soit reconnue.

Les avantages et les inconvénients de cette méthode, qui n'est qu'une modification de celle de Donders, sont suffisamment connus pour qu'il soit inutile d'y insister. Elle est insuffisante comme méthode générale, utile comme méthode de

contrôle, indispensable pour se rendre compte de l'influence de certains visuels, qui réduisent l'aptitude à reconnaître les signaux colorés, sans i directement la fonction chromatique.

Fig. 5.



Chromoptomètre de Dr. Parinaud.

Un Appareil pour l'Appréciation de l'Acuité Chromati un Examen Sommaire du Personnel de la Mari Chemins de Fer.

Dr. Maréchal, Brest.

L'auteur a cherché à réaliser les conditions de l'épreuve dite de " terrai éliminant les repères du métier, qui trop souvent justifient les préféren examinés-viciés accordent à ce genre d'épreuves, et leur fournissent de d'appréciation étrangers aux qualités visuelles ; de plus l'expérience ain parle pour ainsi dire aux yeux de tous, même des membres extra-mé commissions d'examen auxquels elle apporte des preuves matérielles convaincantes.

C'est la réalisation simplifiée d'un procédé déjà exposé à Amsterda (procédé dérivant de la méthode générale de comparaison du Professeur I mais le procédé actuel semble devoir échapper à certains reproches a premier qui consistait dans la reproduction par l'examiné d'une couleu à celle du type proposé par l'examinateur.

Il en résultait en effet que l'assortiment bien exécuté ne démontrait sairement que l'appréciation de la couleur-type fût exacte et que la v attribuer pour les usages courants fût conforme à la valeur réelle, à la re les éléments du spectre, par exemple, mais seulement que l'examiné compte de différences, même minimes, dans les tons d'une couleur quelcon vicieusement appréciée.

Dans l'épreuve actuellement proposée, étant donné un échantillon-t senté par une mire transparente colorée de teintes plus ou moins satur mentales ou de confusion, l'examiné est invité, sans dénommer ni re

couleur, à manifester le jugement qu'il porte sur elle par la signification qu'il lui attribue en vue d'une manœuvre ou d'une détermination précisée à l'avance; c'est l'opération complète de son esprit que l'assistance toute entière peut juger, et cela à chacun des mouvements où elle s'accomplit. Par un signal muet l'examiné accuse définitivement et sans ambages possibles, la précision ou la confusion, la rapidité ou les hésitations de ses impressions chromatiques, et fournit la mesure de ce qu'il ferait sur le terrain, puisqu'il agit dans des conditions absolument similaires. Voici les moyens d'exécution :—

Sur la paroi antérieure d'une même lanterne sont superposées deux fenêtres éclairées par la même bougie, ou mieux par le fond blanc de la paroi intérieure opposée. Derrière la fenêtre inférieure, mesurée par un diaphragme à ouvertures fixes, l'examinateur fait passer un chassis porteur de nombreux verres de couleur et invite l'examiné à faire connaître, d'après l'idée qu'il se forme de la couleur de la mire ainsi établie, ce qu'il ferait sur le terrain, étant donnée la signification que l'on attribue d'ordinaire à ces couleurs.

Celui-ci peut à l'aide de cordons de longueur convenable manier à distance un petit chassis qui porte quatre signes ou plus, estampés à jour, à signification bien déterminée, et en rapport avec les manœuvres principales usitées dans chaque profession.

Enfin, à l'aide de disques transparents partagés en deux moitiées colorées ou non, dont on peut à volonté obscurcir chaque partie et qui peuvent tourner dans le plan d'une des fenêtres, il est facile de confirmer définitivement le vice chromatique reconnu en faisant dénommer dans les différentes positions prises par le disque, la couleur de chaque segment.

On a Method of Opening Closed Pupil after Operation for Cataract.

Dr. Lucien Howe, Buffalo, U.S.A.

By "closed pupil," the author especially refers to the pathological condition so frequently met with when an operation for the extraction of cataract has been followed by severe iritis. In these cases we find the posterior surface of the iris glued to the capsule, the pupil filled with a dense deposit, and more or less drawn upward toward the line of the sclero-corneal incision.

The author considers that none of the methods of operation at present in use are entirely satisfactory. He thinks that of de Wecker to be the best of them, but that some of the difficulties attending it might be partially or entirely obviated, and the procedure considerably simplified by using a triangular "punch" or "iritome," instead of the scissors. The instrument consists, in general, of a triangular blade, having a large aperture in its centre of similar shape, and into this a second blade is made to fit exactly. They are united by a hinge joint in the line of their bases, and continued in the form of a pair of forceps. When the blades are closed, a longitudinal section perpendicular to the plane of the triangles would be represented by a straight line, and when they are open the same section would be V-shaped.

In order to open the closed pupil, a large incision is first made with an ordinary keratome, in the corneo-scleral border, as in the usual method in iridectomy. The instrument described is then passed through this aperture, and as it enters

the anterior chamber, one blade is made to perforate the thickened iris passing behind it, while the other advances in front. By closing a triangular piece is excised. This usually adheres to the cutting edg withdrawn, but, if not, a pair of iris forceps can be introduced and ments removed. There are two disadvantages in the instrument, proper to mention. In the first place, not being bent at an angle like nary keratome, it is a little difficult to introduce in the superior quadrants of the corneal border, especially if the globe be not promine the second place, the corneal incision in this method is larger than is necessary. The former objection may be obviated in the future, I some modification in the instrument, and the latter must be regarded of importance, although fairness requires it to be mentioned.

The manner of operating here indicated, however, has the great adva a sufficiently large piece is cut out of the iris by closing the blades togeth time, and that, too, before any opportunity for hæmorrhage has occu rendering the execution of the manœuvre more simple, and the result more satisfactory than by any similar method which I have employed.

The following demonstrations were given during the afternoons of 5th, and Monday, the 8th of August:

Living specimens by Mr. C. Bader (London).

1.—Gonorrhœal ophthalmia cured by an ointment of vaseline, m daturin.—Seen with Dr. Amsden, of Hoxton. Case, age 17.

January 24, 1879.—Left eye sound. Right eye: extreme swelling a of eyelids, chemosis, purulent discharge; lower third of cornea yellowi ulcerating.

Treatment.—Six leeches right temple; removal of discharge with te use of ointment (Hydrarg. nitrico-oxid., gr. j; daturin, gr. j; vaseline, care to push plenty beneath right upper eyelid thrice daily. Left eye with lint and same ointment.

March, 1881.—Left sound. Right likewise, except some opacity n of cornea. This is the first case thus treated. Purulent ophthalmia in gonorrhœal ophthalmia have up to now been treated by this ointment.

2. Conical cornea; abscission of the cone.—Case, age 63. Seen in c with Dr. W. A. Butler, of Woolwich. An opacity occupies apex of eac lenses assist; great difficulty in following employment.

June 22, 1872.—Iridectomy; slight improvement. Left, no lenses of 200 of Snellen at 10 feet.

September 1, 1872.—Abscission of both cones. September 24.— flat central corneal opacity.

August, 1881.—Reads well with + 7 at 10 inches; with + 11 recog Snellen at 20 feet; followed his office pursuits since 1872.

Dr. Gayet (Lyons).—A complete series of large photographs of s diseased eyes.

Microscopical Specimens.

Dr. Hirschberg, Berlin.—Tuberculosis of the eyeball (see p. 117).

Mr. Story, Dublin.—Tuberculosis of eyeball.

Dr. Samelsohn, Cologne.—Retrobulbar neuritis (see p. 60).
Mr. Marcus Gunn, London.—Specimens of retina.
Dr. Brailey, London.—Sympathetic ophthalmitis (see p. 35).
Mr. Nettleship, London.—Syphilitic choroiditis, &c.
Mr. Priestley Smith, Birmingham.—Glaucoma (see p. 84).
Dr. Eloui, Egypt.—Specimens of cornea (see p. 124).

Apparatus and Instruments.

Dr. Parinaud (Paris).—A chromoptometer for the examination of railway servants, &c. (see p. 124).

Dr. Ole Bull, Christiania.—His new tests for colour-blindness (see p. 126).

Dr. Javal, Paris.—Ophthalmometer of Javal and Schiotz (see p. 30).

Dr. Maréchal, Brest.—An instrument for testing colour vision (see p. 126).

Dr. Pagenstecher, Wiesbaden.—Models in glass to show pathological changes in the eye.

Mr. M'Hardy, London.—A Snellen's phakometer with improved mechanical arrangement.

Dr. Lucien Howe, New York.—A forceps-keratome for opening closed pupil (see p. 127).

Dr. Knapp, New York.—Cystotome and knives used for peripheral cystotomy and secondary operations.

Dr. Nieden, Bochum.—Artificial eyes of vulcanite.

Prof. Von Zehender, Rostock.—Artificial eyes of a new material used in dentistry.

Dr. Stevens, Albany, New York.—A registering perimeter (see p. 123).

Dr. Lopez Ocaña, Madrid, exhibited an instrument designed to facilitate the cauterization of the lacrymal sac with acid nitrate of mercury.

Dr. Libbrecht, Ghent, showed (1) new scissors, the use of which is not attended with hæmorrhage; (2) a double-edged Graefe's knife; (3) a knife designed for secondary cataracts.

Exhibited in the Museum:—

By Dr. William Thomson, Philadelphia.—New arrangements of wools for colour-blindness (see *Trans. Amer. Ophth. Soc.*, 1880).

By Dr. Jaesche, Dorpat.—Chin-rests for preventing myopia.

DISEASES OF THE SKIN.

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BY THE PRESIDENT,

ERASMUS WILSON, ESQ., F.R.S.

MY BRETHREN,—

The Council of the Dermatological Section of this great Medical Congress offers you a hearty welcome.

We assemble to-day as a part of a great International body, for intercommunion of friendship, of information and of thought; and, just as the Congress, taken as a whole, has for its main purpose to diminish pain and suffering, and to promote the health of the people, so we, in our department, have met to co-operate with a similar intention.

The important object now stated, we hope to arrive at, partly by means of the new ideas, which you, our foreign brethren, are about to sow amongst us, and partly by a judicial re-investigation and exposition of the principles which we, at present, adopt for the diagnosis and treatment of cutaneous disease.

The bias of the British medical mind is strongly in favour of those studies which lead directly to the cure of disease; and whilst we recognize fully the advantages and necessity of pathological research in every variety, the conclusion which we seek most ardently to attain, is—the means of restoring our patients most certainly and most readily to a state of health.

As a groundwork for our operations, in this respect, we aim at the regulation

of the general functions of the economy—of those all-important forces, th tions of digestion, of assimilation and of nutrition; for, experience daily p us, that when such regularity is obtained, many of the diseases which called upon to treat yield to the ordinary processes of Nature, and retu state of health without further delay. And this we regard as the true sig of constitutional treatment; by means of which every known disease of may be ameliorated and, in most instances, cured.

But, whilst we thus place constitutional medicine on a pedestal, as d the highest consideration of the practitioner, we by no means disregard t of topical medicine. We have to contend with local lesions, and with lo and for the relief of these we seek for remedies which shall be, at once, convenient and the most effectual. In one case, a purge will relieve the but the addition of a soothing, local application will be requisite for In another case, a local application alone will accomplish a great deal, addition of a constitutional remedy will assist and facilitate the cure.

But, before we can answer the question: "What is the best constit and, "What the best local remedy?" we must have made up our minds cause of the disease, and as to the precise method, by which we shall the removal of that cause. Our treatment must not be haphazard c routine, but must be directed according to a fixed intention. Under cumstances, the treatment of the disease itself is of comparatively s importance. Let us remove the cause, and the disease will be cure neously. Our patient may be a sufferer from eczema; but our patie same time, is a victim to dyspepsia. In such a case it becomes our dut the treatment of the dyspepsia first, and the chances are, that when the is alleviated, the eczema will be wellnigh cured.

In another case, the eczema may be associated with more or less irrit the nervous system, without any leading dyspeptic symptoms; in this our remedies should be directed towards the soothing and quieting of centres and nerves; and, both constitutional and local treatment s invested with a sedative character. If there were any suspicion of in blood in the first instance, there can be none in the second; the fir regarded as, in some sort, a blood-disease; the second as a nerve-disease both, the local treatment would be essentially the same, the differenc them being a difference not of disease but of cause.

Now, what we should endeavour to establish in these cases is n principle of treatment, but also the material of treatment. In the neu arsenic will be found a most useful, and probably an essential remed other, or assimilative case, arsenic would be utterly worthless.

If all cutaneous diseases depended on the presence of a poison in th in the instance of syphilis, the elimination of the poison would be the treatment in every case, and the results would be as satisfactory as we k to be in syphilitic affections. But in other cutaneous diseases it becon sary to settle in our minds whether we have to deal with a disease origin in disturbance of the digestive functions, or whether it be neu greater or less degree; whilst it must likewise be admitted that in cer particularly those of long duration, both causes are apt to prevail.

For therapeutical purposes all diseases of the skin might be assemb except syphilis and diseases proceeding from local causes, under thre namely, diseases depending on disorder of digestion and assimilation

depending on disorder of innervation; and diseases of nutrition. As an example of the first kind we might take eczema, with its multitudinous manifestations. As an example of the second we should have pruritus and prurigo; and, as examples of the third, papilloma and fibrosis. But, we cannot fail to recognize the fact, that, practically, there is a greater or less blending of the whole. The pruritus of eczema belongs to disordered innervation; and aberration of nutrition may be accompanied with symptoms which appertain to both the others.

Thus, in the lepra of Willan—the psoriasis of modern schools—we have a disease which is due to altered nutrition of the skin from defective organization of that structure. But as the nerve-power or life-power of the skin is insufficient to restrain abnormal function, so capillary congestion constitutes a part of the disease; and the hypertrophous growth of papillæ and excessive production of morbid epidermis must be regarded as a passive nutritive change or passive growth. In ichthyosis, with a starved condition of the skin as far as nutrition is concerned, we have an excessive papillary growth, and excessive accumulation in the shape of altered epidermis. But still more interesting illustrations of abnormal nutrition are evinced by excess or defect of pigment; by the substitution of a lowly for a more highly organized tissue, as in fibrosis, and by the exuberant proliferation of cell-tissue of low organization which is met with in the instances of tinea, of favus, and of epithelioma.

If I were called upon to summarize the diseases of the skin such as they exist most commonly in this country;—I should begin with eczema, as occurring at all ages and in every condition of life; tinea might follow next, as a disorder of childhood; then the acne of youth; and next, the so-called acne rosacea of the adult, which latter is actually a form of eczema. The lepra of Willan is not very common; neither is scrofula in its cutaneous forms. Looking to the cause of these diseases, we find, mal-assimilation and nerve-irritability; aberration of nutrition and defective nutrition. And, therapeutically, our most reliable remedies are—mild purgatives, with tonics, in the diseases of dyspeptic origin; nutritive tonics; and especially arsenic, as a nutritive tonic, and in that sense a direct nerve-tonic.

What I have now said is intended to open up to the minds of my hearers a picture of the broad field in which we all mutually labour; to point out that many portions of that field admit of independent exploration; and to show that, starting from the line of our existing knowledge, there yet remains very much to investigate: singly, for the perfection of the parts; and collectively, for the perfection of the whole. This is the field of dermatological culture and research; and with this brief introduction I now call you to the work of our section.

Once more, brethren, we bid you welcome as friends and fellow-workers.

Du Pityriasis Circiné et Marginé; Description de son Mycoderme, le Microsporon anomæon (Microsporon dispar).

Dr. Emile Vidal, Paris.

En 1862, dans un mémoire intitulé, Neue Beobachtungen über Herpes (*Annalen des Charité Krankenhauses*, p. 140, Berlin), le savant professeur von Bärensprung écrivait les lignes suivantes que je traduis textuellement:

"Nous connaissons maintenant quatre affections parasitaires de la peau, bien

distinctes, qui sont engendrées par quatre mycodermes également bien différents les uns des autres, ce sont :

"1°.—Le *pityriasis versicolor*, produit par le champignon découvert par Eichstädt, le microsporon furfur.

"2°.—*L'erythrasma :* j'appelle ainsi, dit von Bärensprung, une éruption contagieuse, bornée le plus souvent aux régions inguinale ou axillaire, se présentant en taches nettement limitées sous l'apparence d'un pityriasis rubra en forme arrondie. Le Dr. Burchardt (*Preuss. Vereinszeitung*, 1859) y a découvert un champignon différent de ceux connus jusqu'alors. Vu la ténuité particulière de ses éléments, il a donné à ce parasite le nom bien justifié de *microsporon minutissimum*.

"3°.—La *teigne* (porrigo luminosa de Willan, appelée à tort favus par Alibert), affection due au développement de l'achorion Schönleini.

"4°.—L'herpès parasitaire qui reconnaît pour cause le tricophyton tonsurans découvert par Gruby et Malmsten."

En laissant de côté le parasite de la pelade (alopecia areata) le microsporon Audouini, dont l'existence est controversée, on peut actuellement ajouter de nouvelles espèces de mycodermes à la courte nomenclature de Bärensprung.

Je citerai d'abord le parasite observé par le Dr. L. Malassez, dans les squames du pityriasis capitis (alopécie pityrode), et qu'il a très-bien décrit, en 1874, dans une Note sur le Champignon du Pityriasis simple (*Archives de Physiologie*, p. 491).

Ce champignon n'est pas toujours plus abondant là où le pityriasis est le plus intense.

Il est caractérisé :

1°. Par l'absence des tubes de mycelium.

2°. Par des spores à double contour, les unes rondes, les autres ovoïdes, se développant par bourgeonnement.

Les plus grosses ont de 4 μ à 9 μ dans le plus grand axe et 2 μ à 2 μ et demi dans la largeur.

Les plus petites n'ont que 2 μ dans leur plus grand diamètre.

Ces spores qui n'ont pas encore été classées et dénommées par les naturalistes sont de la même espèce que celles que l'on désigne sous le nom de spores banales (Nystrom), celles que l'on rencontre dans toutes les exfoliations épidermiques, dans les croûtes, dans l'épiderme de la peau saine, celles qu'on trouve aussi mêlées avec les autres mycodermes, et qu'en raison de leur banalité je nomme les spores de la torula vulgaris.

Outre cette torula, on trouve sur la peau, même chez les sujets bien portants, plusieurs variétés de parasites : des micrococcus, des bactéries, même parfois des vibrions, ainsi que des spores encore mal étudiées et qui vraisemblablement appartiennent à plusieurs variétés.

I. *Description du Microsporon Anomœon.*

Le parasite que j'ai découvert dans une forme spéciale de pityriasis circiné et que j'ai montré, dans une séance du mois de Juillet, 1879, à la Société de Biologie, est parfaitement défini. L'affection qu'il détermine est facile à diagnostiquer.

La facilité avec laquelle guérit le pityriasis, l'extrême petitesse des champignons qu'on ne peut reconnaître au microscope qu'avec les plus forts grossissements, sont les raisons pour lesquelles ils ont pu jusqu'à ce jour passer inaperçus.

En examinant, avec l'objectif à immersion No. 10 de Hartnack, des cellules épithéliales grattées sur un pityriasis circiné, on constate des spores rondes ayant

en moyenne 1 μ. Beaucoup sont plus petites. Les spores d'une dimension plus grandes sont les moins nombreuses; elles ont 2 μ, et, très-exceptionnellement, 3 μ de diamètre.

Les caractères principaux de ce mycoderme sont:

1°.—L'extrême petitesse des spores et une irrégularité de volume très-particulière, qui m'a fait donner à ce parasite le nom de microsporon anomæon ou dispar.

2°.—La disposition en cercle autour d'une cellule épithéliale. On voit aussi des groupes, des amas de spores, inégalement répartis sur des cellules ou entre des cellules qu'ils semblent écarter ou refouler en détruisant leur coalescence.

3°.—La rareté des chaines de spores. Dans quelques préparations microscopiques on trouve des chapelets de 5 à 6 sporules, ayant moins d'un μ de diamètre en préservant l'aspect de petits points noirs rangés en lignes.

4°.—L'absence ou, tout au moins, la rareté extrême d'un mycelium.

Bien que deux ou trois fois j'aie cru voir quelques filaments excessivement fins, je n'oserais affirmer l'existence d'un mycelium, et je serais plutôt enclin à la mettre en doute.

Tous ceux qui ayant étudié pendant plusieurs années les champignons de l'épiderme, connaissent, comme moi, toutes les difficultés d'examen microscopique et toutes les causes d'erreur—même en prenant les plus minutieuses précautions—comprendront ma réserve.

C'est sur les cellules de la couche superficielle, et surtout sur celles de la couche moyenne de l'épiderme, que paraît habiter le microsporon anomæon.

J'ai constaté la présence de ce parasite, non seulement dans l'épiderme qu'il soulève et qu'il exfolie, en produisant une desquamation furfuracée, mais aussi à l'orifice des poils dont la base peut être entourée d'une gaîne blanche, formée de débris épithéliaux et de spores en grande quantité. C'est sur la face, dans la barbe et aussi sur le cou, que j'ai vu cette sorte de pityriasis pilaris. Le poil reste indemne. Le follicule pileux n'est pas enflammé et semble ne subir aucune réaction.

De tous les poils que j'ai examinés, aucun n'était altéré et ce n'est que sur la partie la plus rapprochée de l'orifice que la gaîne épidermique contenait des parasites.

II. *Signes Cliniques du Pityriasis circinata et marginata.*

L'éruption pityriasique produite par le microsporon anomæon débute par de petites taches rosées, à peine saillantes, au dessus du niveau de la peau. La surface en est sèche, et en frottant on détache facilement une desquamation furfuracée.

Ces taches sont irrégulièrement distribuées. Elles commencent ordinairement sur le tronc, mais je les a vues aussi envahir d'abord les bras ou même les cuisses.

Leur accroissement est assez lent. Au bout de quinze jours elles atteignent à peine le diamètre d'une pièce de 50 centimes, après un mois, celui d'une pièce d'un franc. J'en ai vu de plus larges; quelques-unes sont ovales. Dans certaines régions, sous l'aisselle, dans la région inguinale, elles peuvent, devenant d'abord conférentes, puis confluentes, se réunir en plaques qui prennent la forme marginée.

Celles qui restent isolées, guérissant par leur centre et s'étendant par leurs bords, prennent une forme annulaire. Le bord est rose ou rose jaunâtre, en desquamation furfuracée; c'est un vrai pityriasis circiné. Sur quelques plaques, mais

très-exceptionellement, l'épiderme plus largement soulevé forme une col épidermique.

Quand l'affection parasitaire a envahi depuis plusieurs mois la région a ou la région inguinale, elle peut provoquer une irritation plus vive, un int ou même une éruption eczémateuse, et constituer ainsi une des variétés, l légère assurément, de l'affection complexe étudiée par l'illustre professeur sous le nom d'eczema marginatum.

Pour le dire en passant, l'eczema marginatum peut être provoqué par pl espèces de parasites, dont les plus habituels sont:—

1°—Le tricophyton, ce qui est le cas le plus fréquent, celui qui déter formes les plus sérieuses et les plus résistantes au traitement.

2°.—Le microsporon furfur d'Eichstädt.

3°.—Le microsporon minutissimum de Burchardt, avec l'éruption désig von Bärensprung sous le nom d'érythrasma.

4°.—Le microsporon anomæon qui peut donner lieu aux formes les moi noncées et les plus faciles à guérir.

Le pityriasis circiné s'accompagne d'un certain degré de démangeaison v suivant la disposition nerveuse des sujets. Le prurit est plus intense l'éruption parasitaire a pris possession des régions inguinales ou axillaires.

Chez plusieurs des malades que j'ai observés, l'affection durait depuis quatre mois, et même chez l'un d'eux, depuis cinq mois.

III. *Diagnostic différentiel avec le Pityriasis rosea, le Pityriasis versi l'Eythrasma et la Tricophytie circinée.*

(*a.*) L'affection séparée du pityriasis rubra de Dévergie et étudiée pa et Bazin, sous le nom de pityriasis rosea, est généralement confondue pityriasis produit par le microsporon anomæon.

Même apparence de desquamation furfuracée, même teinte rosée ou jaun des taches, voilà pour les traits de ressemblance. Mais le pseudo-exantl Bazin, qui ne s'observe guère qu'au printemps, a une marche régulière et u moyenne de quatre à six semaines, ne dépassant pas deux mois. Son évol régulière. Il débute constamment par la région sternale ou par la région pour s'éloigner graduellement de la ligne médiane et s'étendre symétriquen les membres, guérissant spontanément sur le tronc, pendant que sur les ex récemment envahies, l'éruption est en pleine activité. La décroissance e trique et suit une marche régulièrement descendante. L'état papuleux des r poussées permet de regarder cette éruption comme une variété d'érythème p que je distingue sous le nom de pseudo-exanthème érythémato-desquamati

Le pityriasis déterminé par le microsporon anomæon n'est jamais syn Sa distribution a l'irrégularité capricieuse des affections parasitaires. l tantôt sur la peau du tronc, tantôt sur celle des membres. Sa marche es lière: il peut se prolonger pendant plusieurs mois, tandis que la durée du p rosea ne dépasse pas deux mois. Enfin en cas de doute, le microscope, e reconnaître le microsporon anomæon, affirmerait le diagnostic. Dans les du pityriasis rosea on ne trouve guère que la torula vulgaris, la spore co toutes les exfoliations épidermiques.

(*b.*) Le pityriasis versicolor, facile à distinguer par sa teinte jaunâtre brun, se présente sous forme de plaques, plus ou moins étendues, et ne être confondu avec les formes circinées de l'affection qui nous occupe. Le d

à première vue, ne devient difficile que dans les régions axillaires et inguinales où l'éruption peut prendre la forme d'eczema marginatum. Non seulement on trouverait alors le pityriasis versicolor sur d'autres régions du corps, avec tous ses caractères, mais, en dernière analyse, le microscope montrerait le microsporon furfur d'Eichstädt, avec ses spores volumineuses et son mycelium abondant et si caractéristique.

(*c.*) L'érythrasma de Bärensprung est d'une coloration plus foncée que celle du pityriasis circiné; il est d'un rouge sombre, ne prend que rarement la forme annulaire, produit des plaques plus ou moins étendues, couvertes d'une desquamation furfuracée. Sa durée est plus longue. Il peut persister pendant plusieurs années, comme je l'ai vu sur un malade que m'a montré le Dr. Besnier, mon savant collègue de l'hôpital St. Louis. La résistance plus grande à des agents anti-parasitaires peu énergiques concorde du reste avec cette durée plus longue.

Le champignon de l'érythrasma, décrit pour la première fois par Burchardt,* plus abondant dans les couches superficielles et moyennes de l'épiderme, atteint jusqu'aux couches profondes. Les spores, très-petites et de volume irrégulier, ressemblent assez à celles du microsporon anomæon, mais elles ne sont pas, comme nous l'avons vu pour celui-ci, disposées en cercle autour des cellules. Ce qui constitue le caractère distinctif du parasite de l'érythrasma, c'est un mycelium formé de filaments d'une ténuité extrême, d' $\frac{1}{1200}$ de millimètre, les uns droits, les autres recourbés, à contours lisses, ni articulés, ni ramifiés, enchevêtrés les uns dans les autres et très-nombreux. Nous avons déjà dit que le microsporon anomæon n'a probablement pas de mycelium.

(*d.*) La tricophytie circinée (herpès circiné parasitaire, *ringworm*) ne pourrait être confondu qu'en raison de sa forme annulaire; mais la multiplication moins rapide des points envahis, leur nombre beaucoup moins grand, son début sur les régions découvertes, sa contagion évidente et facile, les symptômes d'une excitation plus prononcée de la peau, irritation pouvant produire des vésicules et des croûtes, l'altération des poils dissociés par le parasite, tous ces signes si différents du pityriasis circiné et marginé rendent le diagnostic facile.

Les spores relativement volumineuses du tricophyton tonsurans, leur volume régulièrement égal, leur apparence brillante, leur mode de groupement, le mycelium ramifié, font facilement reconnaître ce champignon et lui donnent une figure tout-à-fait individuelle et bien différente de celle du microsporon anomæon.

IV. *Etiologie, Pronostic, et Traitement.*

Je n'ai pas encore vu le microsporon anomæon sur des sujets âgés de plus de 40 ans. L'âge des malades dont j'ai recueilli les observations est compris entre 6 ans et demi et 36 ans.

J'ai eu à soigner plus de femmes que d'hommes. Cela tient-il à ce que les femmes viennent consulter plus volontiers; cela depend-il de la délicatesse plus grande de leur peau? c'est ce que je ne saurais affirmer.

Je ne connais encore aucun exemple de contagion du pityriasis circiné; et pourtant la nature parasitaire de l'affection rend probable sa transmission, et cela, malgré mes essais infructueux d'inoculation. Vainement sur moi-même et sur plusieurs de mes élèves j'ai insinué sous l'épiderme des cellules épithéliales couvertes du microsporon anomæon. Vainement encore les ai-je laissées pendant plusieurs jours

* Ueber eine bei Chloasma vorkommende Pilzform, in *Mediz. Zeitung*, No. 29, Juillet, 1859. Berlin.

sur la peau saine ou encore sur la peau dont j'avais raclé la couche épidermique la plus superficielle.

Je me suis demandé si ce parasite ne serait pas transmis à l'homme par les animaux. Il a quelque ressemblance avec un microsporon trouvé par Mégnin sur les plumes de certains oiseaux. Deux de mes malades exerçaient des métiers qui les mettaient en contact journalier avec des plumes. Je me propose de tenter de nouvelles expériences pour voir s'il est possible de reproduire ce parasite sur les mammifères ou sur les oiseaux.

Le pronostic est des plus bénins, tant est grande la facilité avec laquelle cette affection parasitaire cède aux traitements les plus faibles.

Je l'ai vu guérir après l'administration de quelques bains sulfureux, après de lotions au savon de goudron. Je combine habituellement ces deux moyens et je fais laver le malade, matin et soir, avec de l'eau sulfureuse additionnée de savon de goudron.

J'ai employé aussi avec succès les glycerolés au calomel, ou au précipité jaune, ainsi que la pommade au turbith.

Un malade dont l'affection durait depuis deux mois et demi a été guéri après 15 bains au savon ordinaire.

Cette extrême facilité de guérison est tout-à-fait particulière à l'éruption causée par le microsporon anomæon ; c'est ce qui l'a fait confondre jusqu'à ce jour avec le pityriasis rosea dont elle se rapproche le plus par les caractères objectifs.

On Balano-posthomykosis.

Professor Oscar Simon, Breslau.

My attention has of late been called to a certain affection of the preputial sac, which is very obstinate, and sometimes causes great inconvenience. At first I believed the cases that came under my notice to be cases of simple balano-posthitis, and I applied the ordinary remedies, without seeing any noticeable effect. On the contrary, the cases grew worse and worse, and led gradually to very remarkable conditions, which, I believe, have till now not been sufficiently appreciated.

Closer examination proved these cases always to be the effect of a vegetable parasite, and so the difference in their relations to ordinary forms of balano-posthitis became clearer.

The different appearances which this affection showed—partly successively in the same patient, partly in different patients—may easily be grouped in a series of several consecutive stages.

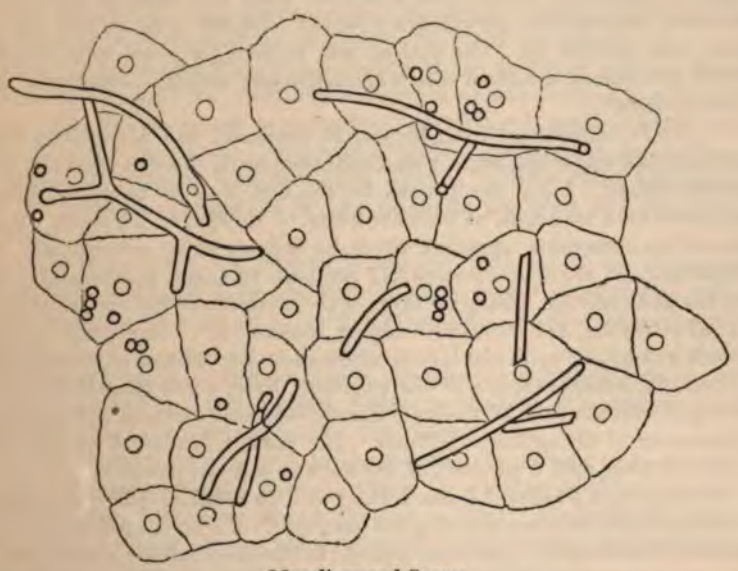
In the beginning, the patient complains of slight itching and burning on the glans and the inner surface of the prepuce, and generally, for a certain time, nothing is apparent but a slight erythema. By-and-by a more pronounced irritation sets in, the disagreeable sensations above referred to increase, and, in some cases, a yellowish puriform secretion commences, which sometimes is so profuse as to lead the patient to suppose a gonorrhœal infection. This secretion gradually provokes superficial erosions. The skin, especially on the preputial margin, is apt to crack with painful sores. In the meanwhile the chronic inflammation and swelling induce a disproportion between the circumference of the glans and the swollen prepuce, and the drawing back of the latter becomes from time to time more difficult. At the same time, retraction and shrinking take place in the inner layer of the prepuce, finally resulting in a phimosis, sometimes so complete that the

drawing back is absolutely impossible. All along, the inflammation and abundant secretion in the preputial sac continue.

Whilst, in some cases, the process now comes to a standstill, I have observed in rare cases still graver forms. Under the influence of the fungus, various kinds of proliferation ensued. Sometimes it affected the epithelial layer, and we then see, especially on the surface of the glans, thickened white callous masses, which are permeated by fungus elements. In other cases, the connective tissue is the chief seat of the disease, resulting in papillary growths, which closely resemble papilloma acuminatum (or pointed condyloma). In other cases, larger growths are formed, which are disposed to break down and to ulcerate on the surface, while, on the preputial margin, deep sores (rhagades) originate. All these growths are permeated through and through with the fungus.

Up till now I have not observed communication of this parasitic affection from patient to patient; but, nevertheless, attention might well be directed to this point.

Fig. 6.



Mycelium and Spores.

As to the nature of the fungus under the microscope, it is observed to consist of both mycelium and spores in great profusion and in all stages of development. The spores, or conidia (as the accompanying sketch tries to show), are chiefly round, sometimes oval. They vary in size, averaging from mm. 0·002 to mm. 0·004 in diameter. Generally, free spores are met with everywhere, sometimes two and two together; more rarely they are grouped in the form of chains. The mycelium consists of formations varying from mm. 0·0015 to mm. 0·0045 in diameter. They are sometimes short, and without ramifications; sometimes long, and with a rich display of branches. They are either forked, or send off their branches at different points. They are sometimes empty, or they may contain spores. The tops of the branches frequently show a separation of the outmost parts in form of single spores. Sometimes the mycelium thread bulges out in the midst of its length, up to mm. 0·005. I never found sporangiums or organs of fructification.

The fundamental cause of the disease was always diabetes mellitus apparent that the fungus finds a good nourishing fluid in the diabetic u tained in the preputial sac. Moreover, masses of smegma, liable to decomp will favour its development.

I now give a short abstract of two cases :—

1.—Mr. G., 55 years old, manufacturer, had complained for some time venient itching, and burning at the glans and prepuce. He had been dia nine years, and made annual visits to Carlsbad. At present the urine contai cent. of sugar. On the prepuce, slightly phimotic from infancy, we find changes, chiefly affecting the inner layer. The whole of the mucous mem dry and smooth, and the tissues seem to be shrunk. Deep sores and fissure the margin of the prepuce, while the surface of the glans is cracked and From the inner surface of the prepuce springs a large growth, similar to flower excrescence, and fills up a great part of the preputial sac. Scrapi all parts of the surface show masses of fungus, consisting of spores and n threads. The patient was ordered a carbolic lotion and salicylic powde some days, the papillary growth was removed with the scissors, and th healed with carbolic oil. The patient was relieved for some time, wh painful excoriations, combined with a blennorrhagic secretion, appeared. left for Carlsbad.

2.—Mr. L., refreshment-room keeper, 44 years old, had a syphilitic years ago, and was subjected to a mercurial treatment. Twelve years ago was first noticed. I saw the patient for the first time in February, 1 complained for a long time, at least five years, of troubles in the penis. years he has observed a secretion, which he believes to be gonorrhœal. present moment, the urine contains 5·17 per cent. of sugar, besides albu feels low and fatigued. The inner layer of the prepuce and the surface of look red and moist, as if they were highly eczematous. Some parts ar by thick callous-like epithelial layers, others show deep fissures of the tiss cipally at the anterior margin of the prepuce. Everywhere fungoid ele be scraped with the back of the knife from the diseased surfaces, and als interior parts of the epithelial callosity. The patient is advised to use solution of soap, with 2 per cent. of thymol and salicylic powder.

For some time I believed I was dealing with an affection hitherto un the male subject, only remembering the description of a similar affection i However, I afterwards found some remarks in literature referring to the ject. One of these is by Friedreich (*Virchow's Archiv*, vol. xxx. p. 476, 1 gives a short notice, On the Constant Occurrence of Fungus in Diabetic His observation is based on the fact, already described by Hannover *Archiv*, 1842, p. 281), and Hassall (*Med. Chir. Trans.*, vol. xxxvi. p. 23, 1 fungus develops in the diabetic urine, even after very short exposure t These same fungi Friedreich constantly found on the genitalia of dia viduals. Referring to the clinical symptoms, Friedreich only says, that "t seems to play no small part as a source of the irritating symptoms so of on the genital organs of diabetic persons, and gives rise to the itching an and even painful excoriations, so annoying to the sufferers." Gubler (*D Sciences Médicales*, 1864) affirms similar facts. Another author, de Bea more closely investigated this matter, as I only discovered after having fi own observations. De Beauvais (De la Balanite, de la Balano-posthite I et du Phimosis Symptomatique du Diabète : *Gaz. des Hôpitaux*, 1874, pp. 8

has likewise found the fungi, discovered by Friedreich, and the same irritating symptoms, which I have described as the first stages of the disease—viz., erythema and phimosis. He has observed complications of the disease with herpes præputialis, carbuncular affections, and gangrene, which in one case stretched as far as the scrotum. De Beauvais quotes Bardsley, of Manchester, as the first who, in 1807, drew attention to diabetic phimosis. However, I found that it had been already mentioned by Rollo, who, in the year 1798, in his "Cases of the Diabetes Mellitus" (London, 2nd ed. p. 337) writes about a diabetic patient: "a phimosis, with excoriation and itching of the prepuce, except after voiding the urine, at which time there is an intolerable smarting." A further remark we find in Naumann ("Handbuch der Medic. Klinik," Berlin, 1836, Band vi. p. 588) to this effect: "in several cases of diabetes I have found caseous exudations on the surface of the glans, with excoriations and sores. Swelling of the prepuce, and even a certain amount of phimosis, is not uncommon; finally, the prepuce can become the seat of eczematous (*flechtenartiger*) eruptions." Later on, Trousseau (*Medic. Klinik*, Deutsch von Calmann, 1868, Band ii. p. 724), Niemeyer, Demarquay (*Gaz. des Hôpitaux*, 1869, p. 153), and others, mention the genital organs as subject to irritation in diabetes, without knowing the mycotic nature of the disease.

In spite of the frequency of these publications, the disease in question does not seem to have met with the attention it deserves in many and not unimportant respects. The handbooks and monographs on diabetes only mention the irritations of the genitalia. Above all, I have vainly searched in all the dermatological and syphilographical treatises for any remark alluding to these facts, although they are of the greatest consequence for the diagnosis, prognosis, and especially the treatment.

As to the *frequency* of the disease, it appears to be not at all uncommon in its milder form, although it seems never to occur on the circumcised, who, on the other hand, we know to be so subject to diabetes. Graver cases, at any rate, are rare.

The *prognosis* of the disease is always far more unfavourable than in balanoposthitis non parasitica. Nevertheless, if diagnosed in time, it is possible to hinder the development of the more aggravated conditions.

As *prophylactic* measures, next to the general and dietary treatment of the fundamental disease, we shall have to advise the diabetic patients to clean the preputial sac thoroughly after every evacuation of urine. To ensure the necessary dryness of the preputial sac and the disinfection, he must always use a disinfecting powder, which I prescribe according to the following formula:—

Oxide of zinc,
Amylum, each 25 parts,
Salicylic acid, one part.

When the disease has actually set in, we must first try to remove the fungus layer with lotions of carbolic acid or soap solutions, if the patient can stand them. In graver cases, I think we ought to have resort chiefly to galvano-caustic treatment, on account of the well-known inclination of diabetic persons to gangrenous processes, even after the slightest operative interference, and the unlimited extension of this gangrene. At any rate, we shall have, before and during the operative cure, to deal with the general condition of the patient, and always combine the surgical treatment with an energetic and thorough treatment of the diathesis.

Therefore, it is of great consequence to come to a correct diagnosis in all cases. For, if we immediately circumcise the prepuce, or have recourse knife or scraping-spoon to remove the hypertrophic growths, we may endan life of the patient.

Finally, I should like to draw general attention to the fact, that sometin above disease is the only symptom the diabetic patient complains of, and is i sufficient, especially when exactly and microscopically investigated, to di diabetes, for the parasitic balano-posthitis, or balano-posthomykosis, is lim diabetic individuals.

DISCUSSION.

Professor KAPOSI, Vienna, mentioned that he knew by practical experien diabetic patients are disposed to balanitis, and in a case of chronic balanitis induced by this experience to make an examination, and to discover the di Now, it is known that sugar in decomposition may be an irritant for the mucou brane, but, at the same time, serves as a favourizing medium for the prolif of fungus matter. He asked Dr. Simon if he did not find fungus in b having a different origin. If such is the case, it could be supposed that the is merely accidental.

Dr. LIVEING, London, remarked that sugar is an irritant to the skin. In d the irritation is more common in women than in men.

Mr. MALCOLM MORRIS, London, said that he had examined microscopic smegma removed after the operation of phimosis performed on a man of 2 and found fungus somewhat similar to that shown by Professor Simon.

Dr. UNNA, Hamburg, remarked that sugar must not in all circumsta considered as favourable to the development of fungi. In certain condi for example, in impetigo contagiosa—sugar acted destructively on fungi.

The PRESIDENT remarked that the papers read before the Section, and the scopic research which had been pursued by different and numerous invest served to confirm the opinion that wherever there was organic matter in a decay, there likewise would be found organic beings, animal or vegetable, r save such matter from destruction. No doubt, it was owing to a law of th that the world was made fit for the occupation of higher beings; and that such a law putrefaction and destruction might gain the ascendency. It economical law of Nature that organic matter should not be lost, but only its place. The accumulated secretions within the prepuce were necessarily with organic matter, and afforded a rich soil for the propagation and d ment of a fungus-vegetation such as that described in his Paper on posthomykosis, by Dr. Oscar Simon, of Breslau.

Mr. BALMANNO SQUIRE, London, said that it could not be assumed, as aga Simon's view of the parasite being the chief cause of irritation in diabet glucose was necessarily as irritating to the skin as raw sugar was well know Information was wanting as to whether glucose was an irritant to the skin.

therefore quite possible that the irritation of the genitals found in diabetes was due chiefly to the presence of the parasite Dr. Simon had described.

Dr. Oscar Simon, Breslau, in reference to the statements of the President, replied that the disease must be much rarer here than in North Germany, because cleanliness is much greater here. In his country, poor people, when they retract the prepuce, show very often great masses of smegma, in all stages of degeneration. In reference to the remarks of Prof. Kaposi, he had examined microscopically other (non-parasitic) cases of balano-posthitis, and had found torula in masses, then spirochaeta, in movement, very similar to that in recurrens. He found sometimes spores, but not many, and no mycelium. That the disease is produced by the parasite, and not by the sugar, is proved by the following points:—The parasite develops outside of the body in the urine of diabetic patients, and the same is found in the preputial sac, and internally in the layers of the skin. Further, we know that parasites cause irritation even on the dry external skin; so it is much more probable that they will cause irritation on the more sensitive glans and prepuce.

A Papillary Tumour of the Scalp, with a Short Account of its Histology.

Dr. Alfred Sangster, London.

The patient, a lad aged 16, was quite healthy, and came into Charing Cross Hospital for the purpose of having the tumour about to be described, removed.

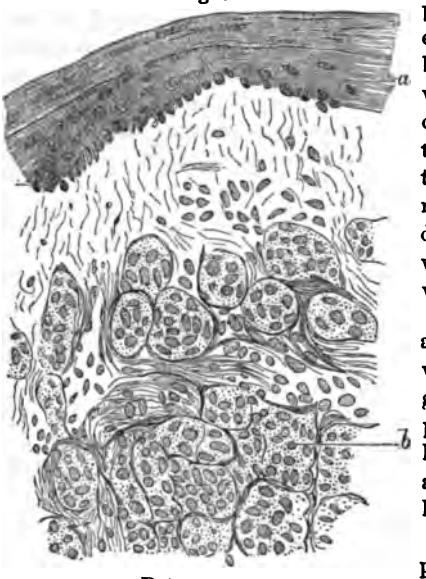
On the hairy scalp, low down on the right side of the occipital region, was a tumour, rather larger than a pigeon's egg. It was oval in outline, and rising somewhat abruptly, its most prominent portion attained the height of about half an inch above the general surface of the scalp. The surface was, all over, thickly set with papules, as large as hempseed in the centre, and gradually getting smaller towards the margin. The colour in the latter situation was brown, changing to a dusky violaceous tint, towards the centre, except in places where superficial ulceration was going on: these were covered by a thin scab.

Hairs were plentiful at the margin, but over the central portion of the tumour they were sparsely scattered, many being white and devoid of pigment. On examination with a lens, the hairs were seen to crop up between the papules, not to pierce them. The general appearance of the tumour was strikingly like that of a sea-mouse (aphrodita). It evidently grew from the superficial structures. The patient stated that he had had the tumour since birth, and that it had gradually increased in size. There was another, similar in appearance, but smaller, over the left ear; this had been removed by Mr. Morgan, in the out-patient department. I judged the growth to be of the nature of a mole. Mr. Barwell, who excised it, and kindly gave it to me, considered it to be a pigmentary sarcoma. I now hand round what is left of the tumour for inspection.

On examining vertical sections through the advancing margin, and tracing the changes from the normal tissue, the first definite departure was seen as elongated branching collections of cells, at first confined to the superficial layers of the cutis:

these apparently corresponded to proliferating cells in the natural channels fibrous tissue, some of them running horizontally. Amongst some of th collections sweat tubes could be identified. As yet, the Malpighian layers no irregularity or hypertrophy. Pigment could be seen dotting the papillar in places. Next, somewhat abruptly, whole collections of the new-growt came into view, monopolizing the papillary body, here and there, and se freely in the cutis. Pigment cells, single and in masses, came into view, ar specially noticeable in the papillary body. The Malpighian layer now irregular, but with its deep limits still plainly discernible.

Fig. 7.



a, Rete mucosum.
b, Neoplastic growth.

On moving the section towa part where the disease was tho established, the identity of str became obscured in the new- which now formed a continuou divided up by delicate fibrous se traversed by strands of epiderm the latter prolonged from the d root-sheaths and Malpighian laye deeper fibrous layers of the ski were hypertrophic, were thickly with cells.

On examining the new grow a higher power, it may be state was mainly composed of oval, gated, nuclei, lying in faintly protoplasmic matter, and more loosely packed, without any arrangement, in round, oval, o loculi, bounded by delicate fibro

In places, the above-descr pearances closely simulated glan especially where sweat tubes identified in proximity, with lin proliferating, and lumen more or less obscured.

This type was, however, departed from in many situations where th was advancing. Here the appearances were more those of a densely fibrous tissue in which the oval nuclei before alluded to could be seen in with connective-tissue cells.

DISCUSSION.

Prof. Kaposi, Vienna, does not maintain that what Dr. Sangster ha strated is the same process which he has described, in 1869, as dermatitis capillaris. To do so, it would have been necessary for him to have seen th or a drawing of the tumour. But the impression he has had from s microscopic sketch, and the portion of the tumour, he is disposed to take i of the same nature as the dermatitis papillaris capillaris (Kaposi) quot Sangster. The process begins with symptoms of inflammation in circ patches on the occiput and on the neck, showing primarily a tissue whi rich in cellular bodies and blood-vessels—in short, having the characters cellular-tissue, with proliferation of epithelium and outgrowth of the

layer. Thus a papilloma is formed, which later is transformed by organization into a fibrous tissue, destroying the hair follicles. He saw no reason to believe that the process was of the nature of epithelioma, either epitheliomatous or glandular. It is not provoked nor sustained by local irritation.

Dr. THIN, London, remarked that the drawings, and more especially the microscopical preparations, shown by Dr. Sangster, afforded conclusive evidence regarding the nature of the tumour. The essential feature of the growth was a mass of epithelial columns having special characters—these characters identifying the neoplasm as being the same in nature as the morbid growth found in the raised border of rodent cancer. This epithelium is to be distinguished from the epidermic epithelium of ordinary epithelioma, and shows signs, more or less marked, of its glandular origin. During the last two years several cases have been shown to the Pathological Society of London, in which a free growth of this glandular epithelium has given rise to tumours of considerable size, instead of the advancing growth breaking down by ulceration.

M. HILLAIRET, Paris, remarked that the affection described by Dr. Sangster might not be more than a superficial inflammation, in which causes of irritation have determined proliferation of epithelial and connective tissue-cells, so that a papilloma was produced, which, however, had not become an epithelioma.

Mr. GASKOIN, London, believes the description of this case to be such as he has seen in a young girl.

Dr. SANGSTER's reply :—

Prof. Kaposi contends that the tumour I am now describing is the same as he described, in 1869, under the name of dermatitis papillomatorum capillaris. As I said before, I cannot consider that they resemble each other in their histological characters. I will simply ask any member who may be interested, to turn to Prof. Kaposi's article and compare his figures with the appearances seen under the microscope in my case.

Dr. Thin contends that the new growth in the case I describe is the same as that seen in rodent ulcer. I am not unfamiliar with the histology of rodent ulcer. No sections, in my possession, of that disease bear any close similarity to those I show now—the vertical arrangement of the peripheral cells, so characteristic in rodent ulcer, is not seen in the section I show; then, again, the nuclei are larger than those of rodent ulcer cells. The clinical facts of rodent ulcer are also suggestive in this connection; our ideas being somewhat strange to the appearance of rodent ulcer on the scalp of a lad 17 years of age. Prof. Hillairet sees nothing extraordinary in the growth, it being simply a papilloma attacked by secondary epithelial trouble, probably as a consequence of irritation. In this opinion I quite agree, except that I think the secondary trouble to be of a sarcomatous nature. Every one present knows that the diagnosis between certain types of sarcoma and carcinoma is a simple matter, but it is altogether different in other instances. Prof. Butlin, who kindly examined these specimens for me, thought that the tumour was of a sarcomatous nature.

Un cas d'Hydrosadénite diffuse produit par l'emploi de la Pilocarpine.

Dr. H. Rasori, Rome.

Si nous passons en revue les principales œuvres de dermopathie et particulièrement celles qui ont été publiées pendant ces dix dernières années, nous ne trouvons dans la plus grande partie de ces ouvrages aucune description de l'hydrosadénite ou inflammation des glandes sudoripares. On ne trouve même pas une note brève relative à ce sujet dans les œuvres d'Anderson (1872), Milton (1872), Cauty (1874), Purdon (1875), Piffard (1876), Hebra (1876), Liveing (1878), Behrend (1879), Morris (1879), Neumann (1880).

L'hydrosadénite n'a été décrite comme entité morbide distincte que par Verneuil, qui en parla le premier en 1854 (*Archives Générales de Médecine*). Après lui, Bazin a fait un traité complet sur l'hydrosadénite (1865) en décrivant des formes arthritique, scrofuleuse et syphilitique, avec des exemples variés. Dans leurs ouvrages Wilson ("Lectures on Dermatology," 1876–7–8), Gamberini (1871), Tilbury Fox (1873), Duhring (1879), Proféta (1881), ont traité de l'hydrosadénite. Mais ces auteurs n'ont pas eu l'occasion de l'étudier comme Wilson, et ils n'ont observé que quelques cas limités à une région du corps.

Beaucoup la confondent avec le furoncle et en font une seule entité morbide.

L'étiologie de l'hydrosadénite est le plus souvent spontanée. On l'attribue aussi à la suractivité des glandes sudoripares, qui se produit principalement pendant l'été, aux sueurs âcres, au manque de propreté, à l'irritation produite sur la peau par des corps rugueux. On l'attribue encore à la succion pratiquée par les nourissons sur les seins qui ont des ragades. Proféta l'a vue se produire sur les mains à la suite du contact de ces parties avec des acides ou des essences. Bazin a décrit une hydrosadénite syphilitique qu'il faisait dériver des gommes des glandes sudoripares; cette variété n'est pas encore admise. Gamberini a observé un cas qui pourrait se rapporter à cette dernière variété. Toutefois dans son observation, il ne s'agit pas des gommes, mais de petites nodosités siégeant sur la paume de la main, dans lesquelles le microscope a révélé des traces de conduits excréteurs déformés.

Depuis la découverte de la pilocarpine et son introduction dans la thérapeutique des affections cutanées, j'ai lu beaucoup de journaux et de revues dermatologiques, et je crois que le cas que je vais rapporter est unique dans la science au point de vue de l'étiologie et de l'extension du processus morbide.

Louise Grossi, née a Caserte, âgée de 12 ans, entra dans la Clinique Dermo-syphilopathique de Rome le 5 Novembre, 1880.

Aucun de ses parents n'avait eu de maladies cutanées. Deux frères et une sœur plus âgés qu'elle ont toujours joui d'une parfaite santé. Dans son pays elle habitait une maison bien aérée et son régime se composait beaucoup plus de végétaux que de viandes. Quand nous l'avons vue l'état de sa nutrition était bon, son système musculaire était parfaitement développé, sa taille était de 1m.31, et son poids de 32 kilog. Elle avait de grands yeux bleus, la pupille mobile; les muqueuses oculaires et buccales étaient normales. Les dents étaient blanches, mais il lui manquait une molaire et elle en avait une de cariée, les gencives étaient quelque peu tuméfiées. Sur son cou régulier on ne voyait aucune trace de pulsation,

et on ne percevait aucun bruit anormal. La thyroide était légèrement développée, les fosses susclaviculaires peu apparentes, le thorax, de forme conique et l'examen méthodique des viscères par l'inspection, la palpation, la percussion et l'auscultation ne révélait aucune anomalie. L'impulsion cardiaque était légèrement augmentée. Pouls 80, respiration 20, température moyenne, 37. L'abdomen était légèrement prominent à cause d'une légère ecstasie stomacale, les organes et les viscères abdominaux étaient sains. Elle n'avait jamais eu de fièvres intermittentes. Les sécrétions et les excrétions ne présentaient rien de particulier, les chlorures étaient légèrement abondants dans l'urine, mais les autres éléments s'y trouvaient en proportions normales. Les excrétions alvines étaient régulières, et se produisaient environ chaque 48 heures.

La peau était de consistence normale et glissait bien sur les parties profondes, elle était sèche et le pannicule adipeux était très-développé. La coloration était brune sur le corps et blanc rosé sur le cou et sur la figure. Elle n'avait jamais porté de laine sur la peau, mais seulement des chemises de toile. Dans l'été elle suait facilement. Quoique la surface de la peau ne fût pas propre, elle prétendait qu'elle se lavait souvent le cou et les pieds, mais que cependant elle n'avait jamais pris de bain général. A son entrée à la Clinique elle présentait un léger épaississement de la peau aux extrémités inférieures et aux bras, sur lesquels on voyait de petites papules disséminées de la grandeur d'une tête d'épingle, surmontées, chacune d'une petite croûte, produite par le grattement que la malade avait du prurit, surtout pendant la nuit. On observait des papules semblables sur le dos; il n'y en avait que quelques—unes disséminées sur la poitrine. Du côté des extenseurs de la jambe, elles étaient plus nombreuses, et il y en avait de 6 à 10 environ sur un espace de 10 centimètres carrés.

En passant la main sur la surface cutanée on avait l'impression d'un corps squammeux ou d'une râpe. En la palpant plus attentivement on percevait quelques petites papules profondes, que le toucher seul pouvait révéler. La peau, comme nous l'avons dit, était brune sur tout le corps excepté sur la face, mais la pigmentation était plus considérable aux extrémités. A la région cervicale et inguinale on sentait que le volume des ganglions lymphatiques était un peu développé, ceux de l'aine étaient un peu sensibles au toucher. Les parents de la fillette assuraient qu'ils avaient remarqué cette altération de la peau chez elle, depuis sa plus tendre enfance.

D'après l'ensemble de ces caractères, M. le Professeur Manassei, Directeur de la Clinique, se crut autorisé de diagnostiquer un prurit simple, pour le traitement duquel il se décida à prescrire l'hydrochlorate de pilocarpine à l'intérieur, à l'exclusion de tout autre médicament. Tenant compte de la nature des lésions qui se produisent dans les dermatoses chroniques, il était rationnel de produire une action qui aurait une influence continue sur les autres sécrétions cutanées.

En conséquence, l'administration stomacale de la pilocarpine se fit à petite dose ($\frac{1}{2}$ centigramme dans 1 gramme d'eau). Le médicament fut administré tous les jours à la même heure avant le repas, à partir du 22 Nov. 1880. La malade était tout de suite enveloppée dans une couverture de laine, et couchée sur le dos dans son lit. L'action du remède était assez rapide. Cinq ou dix minutes après son administration les sueurs commençaient par la poitrine et envahissaient successivement la tête et le tronc. Les premiers jours, la salivation et les sueurs des extrémités manquèrent entièrement. La réaction durait en général deux heures, après lesquelles la malade était essuyée, recouverte de sa chemise et placée dans son lit.

Au premier Décembre, n'y ayant rien de nouveau, la dose de pilocar portée à 1 centigramme. La salivation était alors très-abondante et prét sueur. Depuis peu de jours il s'était produit des sueurs, surtout dans les articulaires. Il n'y eut jamais aucun malaise stomacal, ni de céphalie; l tion et l'appétit s'étaient améliorés.

Le 18 Décembre la salivation et la sueur étaient très-abondantes, mais n aucune modification dans l'état de la peau. on prescrivit trois bains par d'une durée de 30 minutes chacun, en continuant l'emploi journalier de gramme de pilocarpine.

Dans les premiers jours de 1881 on adjoignit au traitement des fric glycérole d'amidon. La salivation était toujours très-abondante, la diminuait et se limitait au visage, à la poitrine et à l'abdomen. Il étai poser que l'organisme s'habituant peu à peu au médicament, ne réagissait comme quand on avait commencé à l'employer. On songeait à en ai légèrement la dose quand survint une nouvelle altération de la peau qui contraire, cesser l'administration.

Sur la peau des épaules, du dos, des extrémités supérieures et inférie aisselles, aux aines, en plus petit nombre sur la poitrine, sur le ventre, su et à la paume des mains, sur tout le corps en un mot, excepté à la plante commencèrent à apparaître de petits points durs, indolents. mobiles, sou qui se soulevaient en plissant la peau, et s'approchaient à la surface Ils différaient essentiellement des papules du prurigo en ce qu'ils n'ét surmontés de la petite croûte qui caractérise celles-ci, mais ils préser petit point rouge qui était peut être le conduit excréteur. Cependant c nodosités, grosses comme une tête d'épingle. commencèrent à devenir dou et la peau qui avoisinait le point rouge prit une teinte violacée.

Dans quelques points, surtout aux aisselles, ces papules atteignirent d'une cerise, et on avait au toucher la sensation d'une mollesse fluct devenait plus nette à mesure que la tumeur s'avançait vers la superficie

Aucune de ces tumeurs n'avait le sommet acuminé comme le furonc coup s'ouvrirent spontanément à leur sommet, quelques-unes s'ouvrir comprimant avec les doigts, pour très-peu, enfin. il fut nécessaire d'avc au bistouri. Une légère quantité de pus écoulée, la cicatrice se fermait ra et le petit abcès laissait après lui une induration qui persistait encore mois dans divers points.

Bien que ces petites tumeurs eussent occupé presque tout le dos, la p extrémités où la peau était soulevée en plaques douloureuses mamel quoique sur d'autres régions du corps, la face y comprise, elles ne fusse distantes que de cinq centimètres, sauf la douleur, elles n'occasionnaie malaise ou de réaction fébrile.

On diagnostiqua une idrosadénite survenue à la suite de l'emploi carpine, et l'on institua un traitement approprié : suspension du médica généraux avec de la fleur de farine, onctions avec la vaseline, et le glycé don.

Du 14 Janvier au 15 Février il y eut, principalement dans les pren une succession de tumeurs qui s'abcédaient et de nouvelles qui apparais

Au mois de Mars s'effectua la résolution de beaucoup d'indurations d au commencement de Mai, il ne restait que quelques points indurés breuses taches sur la peau, qui avait acquis une souplesse et une onc sidérable.

Si la petite malade court, ou se livre à un exercice violent, on remarque qu'elle sue modérément; on observe une rougeur diffuse de la peau, surtout de la peau du visage.

DISCUSSION.

Professor SCHWIMMER, Buda Pesth, had employed pilocarpin in cases of syphilis, prurigo, and pruritus, giving it in subcutaneous injections of the strength of 0·01 gramme, and only in syphilis had obtained any noteworthy results. In one case there supervened on its use a circumscribed inflammation of the skin, which was probably caused by the affection of the sweat glands.

Professor OSCAR SIMON, Breslau, had frequently given pilocarpin in different affections, and found the effects on the skin similar to those produced by simple perspiration. He failed to find exact evidence that in Dr. Rasori's case it was the sweat glands that were affected; that could only have been proved by microscopic sections.

Dr. UNNA, Hamburg, also thought that it was not proved that the sweat glands in this case had been affected. He is persuaded that pilocarpin has no direct action on the glomeruli of the sweat glands, its action being on the blood-vessels of the whole papillary body.

Professor KAPOSI, Vienna, also thought that it is not proved that the process which has been described by Dr. Rasori is produced by pilocarpin, but thought that the facts related are worthy of notice. It will be shown by further observations, if they were the effect of sweat, or a special result of the remedy, like the bromide eruption.

Sur l'Etiologie de quelques Maladies Desquamatives de la Peau.

Dr. ANGELUCCI, Rome.

Parmi les maladies desquamatives de la peau il y en a très-peu jusqu'à présent qui ont été considérées comme parasitaires. Les parasites qui ont été démontrés appartiennent tous à la classe des *hyphomycètes*. Dans l'hôpital de St. Gallicano à Rome, j'ai eu l'occasion d'examiner bien des cas de maladies desquamatives, qui jusqu'à présent n'ont pas été considérées comme parasitaires. J'ai trouvé constamment de petites *bactéries* dans les squames des plaques du psoriasis, de l'eczéma papuleux, et dans les petits nœuds du molluscum contagieux. Elles ont toutes montré dans l'aspect et par la cultivation, des caractères identiques, de sorte qu'il faut admettre qu'elles appartiennent à une même espèce.

Elles proviennent de cellules elliptiques, allongées, ou un peu cylindriques, longues de 1·5 à 1·7 et larges de 0·7 à 0·8 mm. légèrement colorées en gris. Elles sont mobiles, solitaires, ou unies en petites chaines de 2 à 4, rarement de plus, et forment encore des masses de *Zoöglée*. Dans les cultivations elles se multiplient par fission, et se reproduisent aussi par spores à une température de 38° à 40° C. Les spores se forment dans toute leur étendue, et se rangent en chaines. Mais celles du molluscum contagieux se disposent en zoöglée, vivant isolées, ou tout au plus réunies deux à deux. Une température plus basse ou plus haute leur est

défavorable, et un liquide pauvre en matières nutritives est très-contraire à leur développement. Quand on les cultive dans du sérum après 8 à 10 heures elles prennent l'aspect caractéristique d'une petite chaine composée de petits corps légèrement ovales (spores) séparés par des espaces claires. Après 5 ou 6 jours de culture les spores se détachent, et vivent le plus souvent isolées, grossissent, et s'allongent. Cette bactérie se rapproche par la forme du *Bacterium termo*, mais elle est un peu plus courte, et ne possède pas, comme ce dernier, des appendices aux extrémités. Elle a aussi une grande ressemblance au *Bacterium æruginosum* (Schröter); pourtant, tandis que dans celui-ci les cellules font voir à leur contour une coloration bleue, la nôtre, que je voudrais appeler *Bacterium lepogenum* (de λέπος, *squama*) apparaît au contraire d'une couleur gris-sale, par laquelle elle s'éloigne encore plus des autres espèces.

Les altérations pathologiques provoquées par ces bactéries s'étudient le plus facilement dans le molluscum contagieux. Les premières traces de cette maladie se montrent comme un épaississement de l'épiderme, légèrement recouvert par des squames dans lesquelles on trouve de petites bactéries. Ensuite il se fait un travail destructif plus marqué au centre qu'à la périphérie, lequel conduit à la formation de cavités centrales qui renferment des squames et des corpuscules de molluscum. Les squames contiennent des spores en petite quantité, au-dessus desquelles, dans les parties les plus périphériques de l'utricule, se trouve la couche kératogène formée par une accumulation de granules d'éléidine; cette couche délimite les bactéries et les sépare des parois de l'utricule formés par des cellules granuleuses et gonflées qui ne contiennent pas de bactéries.

Pendant la période de guérison spontanée du molluscum on ne trouve aucune cellule épithéliale normale au-dessus du tissu propre du derme, qui se montre en ce lieu infiltré de jeunes cellules, en contraste avec les squames et les corpuscules de molluscum entourés de zoöglée.

Le processus qui produit et détruit le molluscum, contagieux présente tous les caractères de la nécrose progressive décrite par Koch. Il s'agit de micröorganismes qui amènent une prolifération dans le commencement et le développement consécutif du petit nœud molluscoïde. Cette prolifération est simultanément accompagnée de momification des éléments proliférés. La nécrose du molluscum, comme la nécrose progressive de Koch, ne paraît pas être due à des causes mécaniques, mais chimiques. Dans toutes les deux on trouve une couche de tissu altéré qui ne contient pas de microbies, et qui démarque le tissu sain infiltré de parasites. Même ici est valable l'hypothèse que les bactéries, en agissant de près amènent la momification, et de loin, la prolifération du tissu.

Dans le psoriasis et dans l'eczéma papuleux se développent des processus pathologiques identiques, et l'image microscopique correspond à celle du molluscum, exception faite de la dégénérescence du protoplasme des cellules et de la forme de de la néoplasie. Dans les squames les plus superficielles de ces affections, les bactéries vivent en petit nombre et isolées, et ce n'est que dans les plus profondes qu'on les trouve en zoöglée, séparées des cellules saines de l'épiderme par une couche légère de squames et de cellules épithéliales gonflées et en voie d'altération.

Je ne dirai que peu de mots pour prouver que le *Bacterium lepogenum* est le générateur de ces formes de desquamation. Avant tout, on y trouve la même bactérie, et il se développe un processus pathologique identique. Celui-ci ressemble en tous points à la nécrose progressive des tissus induite expérimentalement par Koch au moyen de greffes contenant des microörganismes. De plus, il est cliniquement prouvé que le molluscum est contagieux.

En dernier lieu les signes cliniques et la forme circulaire du psoriasis, la manière de s'étendre du pityriasis rubra sont semblables aux signes cliniques et à la forme des maladies desquamatives produites par les hyphomycètes. Sila forme clinique des trois affections dont j'ai parlé est différente, cela est probablement dû à ce que la peau dans des individus différents réagit d'une manière différente à l'action du *Bacterium lepogenum*.

DISCUSSION.

Professor Oscar Simon, Breslau, stated that the same bacteria were found, not only in psoriasis, eczema, and molluscum, but in nearly all other skin diseases, in variola (as shown by Klebs), and finally in healthy skin. In molluscum the change begins in the deeper parts (*i.e.*, the formation of molluscum bodies); but the bacteria do not occur in these points, but more to the inner portions, where the non-molluscous degeneration of epidermis takes place. He must, therefore, distinctly reject Dr. Angelucci's conclusions.

Dr. Unna, Hamburgh, agreed completely with Professor Simon, and pointed out that before we can regard granules of any kind occurring in the stratum granulosum as vegetable parasites, we must be able to distinguish them from the normal granules of elaïdin which are always found in this position.

Dr. Vidal, Paris, said that not only micrococci and bacteria were found in molluscum, but also spores of various sizes, some budding, among which it was not possible to distinguish which micro-organism might be the cause of contagion. He had once succeeded in inoculating molluscum, and therefore considered it contagious; but had been unable to isolate any parasitic agent. The same organisms are found in comedones and in healthy sebaceous secretion.

Professor Kaposi, Vienna, believed the greatest care was necessary in drawing conclusions. Hallier and others long ago found vegetable parasites everywhere, but his views were abandoned, especially as clinical experience demonstrated the confusion of diseases to which his theories led. Lang declares that he has even found a mycelium in psoriasis; but has not been confirmed. We should not forget that Nägeli, who has passed all his life in studying microscopic vegetable organisms, declares that he is not able to distinguish between the granules of decaying protoplasm and these minute organisms; we, therefore, are not yet justified in attributing any etiological importance to these bodies, even if they are proved to be truly organisms.

Dr. Allan Jamieson, Edinburgh, remarked on the cycles of opinion as to the causation of skin diseases, the humoral, the parasitic, the neurotic, and, as a subdivision, the vasomotor. Now it was the fashion to refer many diseases to bacteria, and skin diseases were having their turn; but he thought observers proved too much, as all diseases were now being brought under the head of bacteria.

Dr. Thin, London, remarked that he had recently examined a number of molluscum tumours, and had satisfied himself that the growth took its origin in the root-sheaths of the hair follicle, and on the free surface of the epidermis. The tumours he examined had been hardened in bichromate of potash, and he had been struck by finding masses of objects resembling micrococci and cocco-bacteria amongst the

cells which were undergoing the peculiar molluscum transformation. He had, in the meanwhile, suspended his judgment regarding these appearances, as the preparations had not been made under the rigorous conditions necessary in a question of this kind; but in preparations of psoriasis-skin, similarly prepared, and in other preparations of skin, he had not found the same appearances.

Dr. CAVAFY, London, thought that Dr. Angelucci's position would be strengthened if he could show that his bacteria were competent to produce the diseases they were supposed to cause, on transference to healthy skins. He therefore asked whether Dr. Angelucci had made any experiments in inoculation (especially of psoriasis); and, if so, with what results.

Dr. ANGELUCCI, Rome, replied that it was true enough that bacteria were to be found on the healthy skin; but we should remember that these organisms not only require special conditions for their development, but also that their action, and even their essential nature, is subject to modification according to circumstances. This has been proved by the recent experiments of Pasteur, and explains the immunity of certain persons during epidemics, and when exposed to malaria. Parasites, moreover, select certain animal species, and leave others untouched; hence, there is nothing surprising in the fact that bacteria produce pathological results only on some skins, and not on others. Bacteria are easily distinguished from elaïdin granules, as they are coloured by aniline dyes, which the latter are not. On cultivating pieces of molluscum in nutrient fluids, at 38° to 40° C., the bacteria increase much in number, and also the granular elaïdin layer doubles in thickness. The epidermic cell undergoes transformation into a molluscum body *after* it has been converted into elaïdin by the action of the bacteria. He had once succeeded in obtaining a scaly patch on the arm of a person by the application of psoriasis scales.

Ueber vaccinale Hauteruptionen.

Dr. GUSTAV BEHREND, Berlin.

Die nach der Vaccination auftretenden Hauteruptionen sind bisher so wenig beachtet, und die in der Literatur vorhandenen Einzelbeobachtungen so spärlich, dass ich mich nicht in der Lage befinde, an der Hand meines immerhin geringen Materials, alle diejenigen Fragen eingehend zu beantworten, welche sich an dieselben knüpfen, namentlich nicht die letzten Beziehungen dieser Ausschläge zum Vaccinestoffe und ihre Stellung zu den Hautkrankheiten im Allgemeinen, in endgültiger Weise zu fixiren. Gleichwohl hoffe ich Ihnen darthun zu können, dass alle bisherigen Angaben, welche sich fast ausschliesslich auf die sogenannte Roseola vaccinica beziehen, wesentliche Unrichtigkeiten in Bezug auf die klinische Erscheinung und die pathologische Bedeutung dieser Ausschläge enthalten, in zweiter Reihe aber, dass dieselben mit der specifischen Vaccinewirkung nichts zu thun haben, sondern wie eine grosse Reihe anderer symptomatischer Hautkrankheiten nur eine allgemein-pathologische Bedeutung besitzen.

Die Erfahrung lehrt, dass nach der Vaccination an der allgemeinen Körperdecke zwei verschiedene Reihen pathologischer Veränderungen auftreten können, die mit einander in keiner Beziehung stehen und auch in Bezug auf ihre klinische Bedeutung von einander differiren. Die eine Reihe dieser Veränderungen, welche ich als *vaccinale*

Localerkrankungen der Haut bezeichne, nimmt ihren Ausgangspunkt von den Impfstellen selber und bleibt entweder auf die unmittelbare Nachbarschaft derselben beschränkt, oder verbreitet sich von hier aus in continuo auf weitere Körperstrecken, und kann unter Umständen die Impfefflorescenzen an Dauer übertreffen. Hierher gehören die Röthungen und entzündlichen Infiltrationen der Haut, welche die Impfefflorescenzen auf mehr oder weniger weite Strecken umgeben, die Erysipele sowie Eczeme aller Art. Namentlich sind es die letzteren, welche Monate hindurch persistiren können, und welche auch ein wesentliches Glied in der Reihe aller jener Beschuldigungen bilden, welche wieder und immer wieder von den Gegnern der Impfung gegen die letztere erhoben werden.

Die zweite Reihe von Erkrankungen bilden *Allgemeineruptionen*, die entfernt von der Impfstelle, mit oder ohne Fiebererscheinungen, ganz acut hervorbrechen und mehr oder weniger ausgedehnte Strecken der Haut im Zusammenhange befallen. Diese Ausschlagsformen, welche ich als *vaccinale Allgemeineruptionen* bezeichne, und auf welche sich meine Mittheilungen beschränken, sind ziemlich seltene Erscheinungen. Ich habe sie in meiner Stellung als öffentlicher Impfarzt unter den etwa 300 Impfungen, welche ich im vorigen Jahre zu impfen hatte, nur sechsmal beobachtet; hierzu kommt ein weiterer Fall aus der Praxis eines befreundeten Collegen (Dr. David) sowie einige andere Fälle, deren Zahl ich nicht genau bestimmen kann, da ich von denselben nur aus den Mittheilungen der Mütter Kenntniss erhielt, und sie selbst nicht gesehen habe.

Unter diesen Exanthemen ist bisher ausführlich nur die sogenannte *Roseola vaccinica* beschrieben worden, ein hyperaemisches Fleckenerythem, von welchem Hebra* sagt, dass es am dritten bis achtzehnten Tage nach der Vaccination auftrete, dass es sich zuerst in der Umgebung der Impfstellen zeige, von hier aus Schritt für Schritt sich auf weitere Hautstrecken ausdehne, und als eine Lymphangitis der Haut zu bezeichnen sei. Diese Angaben muss ich in wesentlichen Punkten modificiren. In den Fällen meiner Beobachtung trat dasselbe als masernartiges Exanthem ganz acut und gleichmässig an der Körperoberfläche auf, war am schwächsten an den Extremitäten ausgebildet und hatte das Gesicht vollkommen verschont. Gesehen habe ich das Exanthem nur in zwei Fällen; in beiden trat es am achten Tage nach der Impfung auf und schwand nach einem zweitägigen Bestande. Da ich die in den öffentlichen Terminen geimpften Kinder nur am siebenten Tage nach der Impfung zu sehen bekomme, so weiss ich nicht, wie häufig *nach* diesem Termine derartige Erytheme aufgetreten waren, dagegen theilten mir die Mütter zuweilen mit, dass ihre Kinder schon am Tage nach der Vaccination derartige Erytheme bekommen hätten, die jedoch bald wieder geschwunden waren, so dass sie am Tage der Revision nicht mehr gesehen wurden.

Eine zweite Gruppe von Exanthemen bildeten *Urticaria-Eruptionen*. Sie kamen gleichfalls am Tage nach der Vaccination zum Ausbruch und schwanden in ebenso kurzer Zeit, so dass ich sie am Revisionstage nicht mehr zu sehen bekam. Ich erhielt von ihrer Existenz vielmehr nur aus den Mittheilungen der Mütter Kenntniss und kann daher etwas bestimmtes über dieselben nicht aussagen.

Eine dritte Gruppe von Hauterkrankungen bildeten *erythematöse Exsudativprocesse*. Es waren diese Ausschlagsformen genau von dem Charakter des Erythema exsudativum multiforme, welche als über den ganzen Körper ausgebreitete Eruptionen mit ihren typischen Localisationen an den Hand- und Fussrücken zweimal zur Beobachtung kamen. Sie hatten am Revisionstage schon die charakteristische

* Hebra und Kaposi, "Lehrbuch der Hautkrankheiten." Zweite Auflage, Bd. i. p. 50.

Umwandlung in Form und Farbe erlitten. In dem einen Falle gab die Mutte dass die Eruption schon am zweiten Tage nach der Vaccination begonnen und von den Hand- und Fussrücken, wo sie zuerst aufgetreten war, über w Körperstrecken verbreitet hatte; in dem zweiten Falle, der mit jenen gleich vorkam, konnte nur aus dem gleichen Stande der Um- und Rückbildung Efflorescenzen auf den gleichen Eruptionstermin geschlossen werden.

In einem anderen Falle zeigte der Impfausschlag sich in Form einer *vesic Eruption*, welche an manchen Stellen den Charakter eines Herpes, an andere eines gruppirten Eczems besass. Die Mutter gab an, dass die ersten Blä gruppen sich am Tage nach der Impfung, zuerst am linken Arme gezeigt h dass aber, während die älteren Efflorescenzen eintrockneten, täglich neue schübe an entfernten Körperstellen aufgetreten seien. Am siebenten Tag der Impfung constatirte ich in Uebereinstimmung mit dieser Angabe eingetro Bläschen am linken Arme, Gruppen von Bläschen mit molkig getrübtem am übrigen Körper, namentlich im Gesicht und an den Beinen. Mi Eintrocknen der Vaccinepusteln schwand das Exanthem spontan. Auf anderen ganz analogen Fall komme ich an einer späteren Stelle noch zurück.

Die letzte Form, welche zur Beobachtung gelangte, bildete ein *Blasenaus* Er wurde nur einmal beobachtet, und betraf einen ganz gesunden, wohlgeni neun Monate alten Knaben, bei welchem sich schon am Abend des Impfta Gesicht einzelne Blasen zeigten, die sich im Laufe der nächsten Tage durch Nachschübe an den verschiedensten Körperstellen vermehrten. Am achte nach der Impfung waren die ältesten Efflorescenzen theils abgeheilt, theils z ganz dünnen braunen Borke eingetrocknet, während die anderen, je nac Verhältniss ihres Alters, einen molkig getrübten oder mehr klaren Inhalt Die Eruption bildete sich unter indifferenter Behandlung (Kleienbäder, &c kommen zurück.

Wie aus diesen Beobachtungen hervorgeht, können im Verlaufe des V processes an der Haut gewisser Individuen, ausser dem bisher allein beschri hyperaemischen Fleckenerythem—ganz verschiedene Formen entzündlicher I tions-processe auftreten, die, wie ich hinzufügen muss, auf den normalen der Vaccine keinen Einfluss ausüben und als zufällige Begleiterschei derselben betrachtet werden müssen.

Was die Pathogenese der Impfausschläge betrifft, so möchte ich zunächst hinweisen, dass einige unserer französischen Collegen mit Rücksicht auf vesiculöse und pustulöse Eruptionen von einer "Vaccine généralisée" sp Dieser Bezeichnung liegt die Auffassung zu Grunde, dass es sich hie analog wie bei der Variola um eine allgemeine Manifestation des Vacci handele, um Allgemeineruptionen, wie sie den Pocken-Inoculatoren des Jahrhunderts, den Sacco, &c., gar nicht selten begegneten, und di für Hutchinson* und William Stokes† ohne Zweifel die Veranlassung sind, von einer allgemeinen Vaccinia gangraenosa zu sprechen. Eine All eruption von Blasen, ist aber noch keine Allgemeineruption von Vaccineeffl zen, selbst dann noch nicht, wenn sie den letzteren in ihrer äusseren Form sind: sie sind nur dann unzweifelhafte Vaccineefflorescenzen, wenn s Nachweis führen lässt, dass ihr Inhalt verimpfbar ist und normale Vaccinel

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* Hutchinson, *British Medical Journal*, December 13, 1879, p. 960.

† W. Stokes, *Dublin Journal of Medical Science*, 1880, vol. lxix. p. 497.

erzeugt. Auffallenderweise liegen derartige Beobachtungen nur aus der älteren. Literatur, aus den frühesten Zeiten der Vaccination vor, während alle späteren Beobachter von allgemeinen vesiculösen Eruptionen nach der Vaccination die Verimpfbarkeit ihres Inhaltes nicht erwiesen haben, und daher, meiner Ansicht nach, nicht berechtigt sind von einer Vaccine généralisée zu sprechen. Ebensowenig wie diesen Autoren kann ich Friedinger beistimmen, der in der Roseola vaccinica das überzeugendste Symptom der Vaccinewirkung auf den Gesammtorganismus erblickt und dasselbe in eine gleiche Beziehung zum Vaccinestoffe bringt wie das Masern- und Scharlachexanthem zu ihren specifischen Contagien. Dass hier jedoch thatsächlich andere Verhältnisse obwalten, dass es sich bei den Impfausschlägen nicht um eine specifische Wirkung der Vaccine handeln kann, ergiebt sich:

1.—Aus der Mannigfaltigkeit in der Form derselben. Eine solche Variabilität wie hier ist mit unserer Vorstellung von der Specifität der Contagien und der Constanz der durch sie erzeugten Krankheitssymptome schwer in Einklang zu bringen. Das Masern- und Scharlachcontagium und das der Vaccine so nahe verwandte Variolagift variiren in ihren Wirkungen keineswegs so von Individuum zu Individuum wie die Impfausschläge; sie erzeugen vielmehr bei allen Personen bei denen sie zur Wirkung gelangen, ganz bestimmte und in allen Fällen gleiche und so wohlcharakterisirte Symptome, dass wir aus ihnen im Stande sind einen Rückschluss auf die Natur des Contagiums zu machen, welches in einem gegebenen Falle eingewirkt hat, und noch niemals hat beispielsweise das Scharlachcontagium bei einer Person ein exsudatives Erythem, bei einer anderen eine vesiculöse, bullöse, oder pustulöse Hauteruption erzeugt.

2.—Spricht gegen die specifische Natur der Impfausschläge die Zeit, während welcher die ersten Ausbrüche derselben stattfinden oder genauer gesagt, während welcher die Eruption beginnt. In Bezug auf diesen Punkt variiren die Angaben der Autoren, die sich natürlich wieder nur auf die Roseola vaccinica beziehen, ziemlich genau nach der Nationalität. Während nämlich die deutschen Autoren den dritten bis achtzehnten Tag nach der Vaccination als den Eruptionstermin angeben, plädiren unsere englischen und manche französische Collegen für den neunten bis zehnten Tag nach der Vaccination, und es ergiebt sich bei einem näheren Studium, dass die deutschen Autoren hierbei der Autorität Bednar's, die anderen der Willan's gefolgt sind. Im Gegensatz zu diesen Angaben muss ich darauf hinweisen, dass sowohl in den mitgetheilten Fällen, als in einem anderen auf den ich noch zurückkomme, der Beginn der Eruption niemals in die Zeit vom dritten bis siebenten Tag nach der Vaccination fiel; vielmehr trat in zwei Fällen die Eruption am achten, in den übrigen dagegen am ersten oder zweiten auf. Es geht hieraus hervor, dass im Verlaufe des Vaccineprocesses zwei ganz bestimmte Phasen existiren, in denen die Eruptionen stattfinden, von denen die erste spätestens am zweiten, die zweite dagegen am achten Tage nach der Impfung beginnt. Wollte man nun die Impfausschläge auf eine specifische Wirkung der Vaccine zurückführen, so kämme man zu einem Widerspruche, da die Ausschläge der ersten Phase gerade in das Stadium der Incubation der Vaccine, die der zweiten dagegen zu einer Zeit auftreten, in welcher dieselbe ihre Wirkung auf den Organismus bereits beendet hat.

3.—Spricht gegen die Specifität der Impfausschläge der Umstand, dass wir Exantheme von genau demselben Charakter auch nach anderen Stoffen, namentlich nach Gebrauch von Arzneimitteln beobachten. Auch diese erzeugen zuweilen Ausschläge die bei verschiedenen Personen verschiedene Formen darstellen, und die, wie ich in meinen Arbeiten über Arzneiausschläge dargethan habe, nicht von der specifischen

Wirkung der Arzneistoffe selber abhängen. Ich habe in Bezug auf die Arzneiexantheme schon darauf hingewiesen, dass überhaupt die Anwesenheit fremder Stoffe im Blute die Veranlassung zur Entstehung acuter Hauteruptionen geben kann, und so sehen wir zuweilen nach der Aufnahme von pyaemischen Stoffen ins Blut oder nach zufälligen Verletzungen, nach Entbindungen und Operationen selbst geringeren Umfanges, in diesen Fällen wahrscheinlich durch die Aufnahme von Wundsecret oder von Gewebstrümmern bedingt, die eine oder die andere Form acuter Hauteruptionen auftreten, als deren Analoge die Impfausschläge zu betrachten sind.

Unter diesen Verhältnissen beweisen die Impfausschläge bei den betreffenden Individuen nichts weiter, als dass ein fremder Stoff im Blute circulirt; und zwar muss dieser Stoff für die Ausschläge der ersten Phase die Vaccinelymphe selber sein, während wir die Ausschläge der zweiten Phase nicht mehr auf sie zurückführen können, sondern vielmehr, da ihre Eruption mit dem Beginn des Suppurationsstadiums zusammenfällt, der Resorption von Pustelinhalt zuschreiben müssen.

Aber abgesehen von der abnormen Constitution des Blutes ist zur Entstehung derartiger Exantheme noch eine gewisse Prädisposition des Individuums, eine gewisse Reizempfänglichkeit der Haut erforderlich, weil nicht alle Personen, welche einer derartigen Diathese unterliegen, von Hauteruptionen befallen werden. So wurde jedes der Kinder, welche Gegenstand obiger Mittheilungen sind, zugleich mit zwanzig bis dreissig anderen von demselben Stammimpfling geimpft, ohne dass eins der anderen erkrankte.

Sie sehen also, meine Herren, dass wir genöthigt sind für gewisse Fälle von Hauterkrankungen einen diathetischen Ursprung anzuerkennen. Dass bei der Entstehung aller dieser Erkrankungen die Nerven eine gewisse Rolle spielen, ist in neuerer Zeit, namentlich durch die bekannten Arbeiten von Lewin, dargelegt worden, indess kann in den vorliegenden Fällen der Einfluss der Nerven doch keineswegs als ein primärer aufgefasst werden. Denn mag man ihnen bei der Genese derartiger Erkrankungen eine Rolle zuertheilen, welche man wolle, immer werden sie noch eines Instrumentes bedürfen, um in dieser Weise zu reagiren. Das Primäre wird demnach hier doch immer die Alteration des Blutes sein, und es führt nur die Kenntniss der in Rede stehenden symptomatischen Ausschlagsformen nothwendigerweise dahin, nicht allein gewissen acuten Hauteruptionen, sondern auch manchen Fällen chronischer Hauterkrankungen, einen hæmatogenetischen Ursprung zuzuerkennen.

Denn wenngleich die Impfausschläge an sich gutartiger Natur sind und in der Regel einer spontanen Involution unterliegen, sokönnen sie doch unter Umständen bei gewissen dazu disponirten Individuen zu lästigen Erscheinungen führen, was namentlich in Bezug auf die Eczeme der Fall ist. So wurde von mir im vorigen Jahre gleichfalls ein etwas rachitisches Kind mit aufgetriebenem Abdomen geimpft, welches hinter dem linken Ohre ein kleines nässendes Eczem hatte, und es zeigte sich bei demselben am siebenten Tage, abgesehen von einzelnen isolirten Pusteln grösseren Umfanges und einigen eingetrockneten stecknadelkopfgrossen Bläschen nicht allein eine Ausbreitung des schon bestehenden Eczems, sondern es traten auch an verschiedenen anderen Stellen, namentlich des Gesichtes, verschiedene Gruppen von Eczemefflorescenzen auf, welche die Impfefflorescenzen mehrere Monate überdauerten und zu secundären Drüsenanschwellungen führten.

Unter diesen Verhältnissen wird eine Thatsache erklärlich, die schon seit langer Zeit bekannt ist, aber nicht richtig verstanden, den Impfgegnern eine Hand-

habe zu ihren Agitationen gegen die Impfung gegeben hat. Es bezieht sich dies namentlich auf die Anschuldigung, dass durch die Vaccination Scrofulose übertragen werden könne. In vielen Fällen hat man hierbei das Auftreten von Eczemen im Auge gehabt, indess kann es nunmehr keinem Zweifel unterliegen, dass bei Kindern, deren Haut zu eczematösen Erkrankungen neigt, Eczeme ganz in derselben Weise zum Ausbruch kommen wie bei anderen Roseola, Urticaria, und exsudative Erytheme, und da die Eczeme sich häufig an die Impfung anschliessen, dieselbe zuweilen überdauern, und nach ihrer Beseitigung Drüsenschwellungen hinterlassen können, so hat es den Anschein als sei in derartigen Fällen Scrofulose übertragen worden. Ich habe häufig nach der Impfung Eczeme entstehen sehen, obwohl ich niemals Lymphe von scrofulosern Kindern verimpfe, und ich kann nach meinen obigen Beobachtungen meine Uberzeugung nur dahin aussprechen, dass wenn ein Kind nach der Impfung von einem Eczem befallen wird, die Schuld hieran nicht die Impfung, sondern vielmehr die individuelle Reizempfänglichkeit des Kindes trifft, und das diejenigen, welche hieraus einen Grund für ihre Agitationen gegen die Vaccination herleiten, in richtiger Consequenz auch gegen den Gebrauch von Arzneimitteln sprechen müssten, die zuweilen Eruptionen erzeugen, welche den Impfausschlägen als gleichwerthig an die Seite zu stellen sind.

Zum Schluss möchte ich noch auf die vollkommene Analogie dieser Impfausschläge mit gewissen Ausschlägen bei Variolakranken hinweisen. Auch bei diesen werden in zwei ganz verschiedenen Perioden der Erkrankung Ausschläge beobachtet, von denen die Frühformen vor dem Ausbruch der Variola, also im Prodromalstadium auftreten und als Prodromalexantheme bezeichnet werden, während andere wiederum später im Maturationsstadium hervorbrechen. Diese Analogie der die Pocken begleitenden Exantheme mit den Impfausschlägen beweist, dass auch jene nicht auf einer specifischen Wirkung des Variolagiftes beruhen, dass sie vielmehr nur eine allgemein-pathologische Bedeutung haben, d. h. nur beweisen, dass ein remder Stoff im Blute circulire, und dass demnach das Prodromalexanthem der Pocken nicht die prognostische Bedeutung besitze, welche demselben allgemein beigelegt wird.

DISCUSSION.

Dr. Von Hebra (Vienna) agreed with the division of the vaccine exanthemata which had been made by Dr. Behrend. He himself had observed similar cases in the Vienna Foundling Hospital. The appearance of the rash after vaccination corresponds to the prodromal exanthem of variola, which is characteristic of the disease, and which, when it spreads over the whole body and becomes hæmorrhagic, causes the death of the patient before the variola eruption has developed.

Professor Hardy, Paris, does not know the German language sufficiently to have followed the details of Dr. Behrend's cases, but wished to communicate the result of his experience relative to the eruptions which appear after vaccination, of which he had observed a certain number. These eruptions can be divided into three orders:—1. Pustular vacciniform eruptions, which are nothing else than generalized vaccine—a general vaccine infection instead of a local vaccine infection; 2. Non-pustular exanthematous eruptions, such as roseola, various erythemata and urticaria. These rashes develop usually before the vaccinal eruption, and last from three to eight days; they have no influence on the vaccinal eruption; 3. Diathetic eruptions, and particularly eczema and impetigo, which develop in persons predisposed to these affections. In these cases the vaccine provokes the eruption accidentally.

Hence the rule that children affected with eczema should not be vaccinated t the eruption is cured. These vaccinal eruptions have nothing characteristic, the prognosis is usually favourable. Nevertheless, in some cases they may be serious. M. Hardy referred to a case in which the eruption was fatal. It w case of pustular eruption, in which gangrene developed around the pustules, the child, aged two months and a half, died in eight days, with symptoms of j tration. Another case, of which M. Hardy retains an unpleasant reminiscen that of a grave attack of urticaria, of which he was the subject in 1870. T days after being revaccinated, he was attacked by an intense urticaria devel on the skin and on the bronchial mucous membrane, in the latter situation, exc attacks of suffocation so serious as to put his life in danger. But these case exceptional; and most usually in eruptions due to vaccine, the prognosis is fa able.

On the Causes of Alopecia Areata.

Dr. Robert Liveing, London.

In bringing before you the subject of Alopecia Areata, and in trying to dis the parasitic origin of the disease, I am aware that I lay myself open to the c of an attempt to "slay the slain." A reference, however, to many writers o subject will satisfy anyone that a belief in the parasitic nature of the dise still widely entertained. I shall, therefore, without further apology, apply n to the subject.

I purpose to say but little on the fungus theory directly, but rather to s it indirectly. In short, the theme of my paper is—*that the clinical features disease, alopecia areata, cannot be explained on the parasitic hypothesis.*

I. As to positive evidence. Ever since Gruby described, in 1843, a micro fungus in area, there have always been able supporters of the parasitic t The late Dr. Bazin was for many years its most powerful exponent, a carefully describes and figures the microscopic appearance of the hairs aff but while he supports generally Gruby's view, he gives a totally different de tion of the fungus, and at the same time draws a distinction between two va of the disease, both parasitic. Comparing the fungus with that of tinea tons he says that in alopecia areata the spores are smaller and more numerous, an the mycelium is *more abundant;* and with this his plates exactly corre Contrast this description with that of a distinguished and more recent ob Professor Malassez. He says that the spores, some of which are nearly a as those of the tricophyton, are found abundantly in the epidermis, as wel the hairs, but that there is a *complete absence* of mycelium. I will not exte remarks on this point.

I have referred very briefly to the history of the observations of three re tative men, and you will notice that they do not agree even on the most es points.

Next, as to negative evidence—it is almost overwhelming. Many com observers in Europe and America have searched, but searched in vain for a scopic fungus. We must remember, however, that *negative evidence* cou little in comparison with positive statement; and as it is impossible to den ability to those who have been advocates of the parasitic hypothesis, it

well to refer to a possible source of error. In 1870, I recorded the occasional occurrence of perfectly smooth bald patches in tinea tonsurans *exactly* resembling those of common alopecia areata,* and a little later, I offered this fact as an explanation of some of the mistakes that had arisen. Quite lately, Eichhorst has found abundance of spores in *one case out of nine* very carefully examined, and I have little doubt that this ninth case was really one of bald tinea tonsurans. I would remark, in passing, that when in common tinea tonsurans, one patch becomes quite bald the others quickly follow suit.

II.—I pass now to the second, and main part of my subject, in which I shall endeavour to show that alopecia areata is a disease of nutrition, the result of faulty innervation; and that the clinical characters of the disease cannot be explained on the parasitic hypothesis.

1.—Let me briefly refer to the constitution of those who are liable to it. We know that it may occur at almost any age, and that it is rather more common in the young than in the old. It is probably more common also in persons of nervous temperament than in others, but on this I do not wish to lay any stress. There are, however, two points of importance to which I would draw especial attention; first, its great tendency to recur, and secondly, its slight, yet notable disposition to appear in different members of the same family. The former fact has been but little dwelt upon by writers, and yet I should say that it was one of the most constant features of the disease. A second attack is very common, and I have met with patients suffering from their fourth or fifth attack, with considerable intervals of complete immunity.

Our President, Mr Erasmus Wilson, has recorded several cases of very frequent recurrence of this disease; but it is not necessary to quote cases; the point will be conceded by all who have had opportunities of seeing many examples of the malady. This would surely indicate the existence of a constitutional tendency to the disease, which is confirmed by the fact that there is an undoubted hereditary disposition to area in some families.

2.—I shall next ask your attention to the various local forms of functional nerve disturbance, which often precede or follow the loss of hair.

It is now about eight years since my attention was first called to an example of almost complete insensibility of the skin over patches of area in a young lady, the daughter of a medical man; and since that time I have met with many similar cases, in which the sensibility of the skin has been, for a short time, lost, or very much impaired. Only quite lately I have had under my care a lady aged about thirty, who is suffering from a second attack of almost complete alopecia areata of the scalp, and who could not distinguish between cold and hot water applied with a sponge. I have still under my occasional observation a middle-aged man who was in the Middlesex Hospital, with three large patches of area, associated with complete loss of sensibility, which lasted for several weeks. The hair has now grown perfectly over all three patches; on one it remains white, while on the other two it has resumed its natural colour.

I would make one observation with regard to almost all the cases of loss of sensibility that I have met with, and it is this—that it appears as a very early and temporary symptom, and is *not* usually present in those cases which are attended

* First Edition of "Notes on the Treatment of Skin Diseases," and more fully in the Third Edition.

with atrophy of the skin, in which one might have expected to find it; in short, what I refer to is a functional disturbance, passing away long before the hair is restored. A more common nervous symptom is that of neuralgia and nervous headache, or a sense of tenderness of the skin on being touched; but all these subjective symptoms often disappear quickly, though the trophic nerves do not readily resume their proper functions.

3.—The action of blistering fluids on patches of area is instructive. It often happens that fluid quite strong enough to blister other parts of the scalp will not produce a blister on the spot of area. I have noticed this so often that I am sure it is not a very rare phenomenon. It certainly points to a low state of nervous vitality in the part affected.

4.—With regard to the regions especially liable to be attacked, we meet with examples of alopecia areata of every degree of severity, from a single bald patch on the head to a complete loss of every hair on the body. Now, whatever we may hold with regard to a bald spot on the scalp, it is very difficult to believe that these latter cases, in which the shedding of the hair is often very rapid, can be produced by a vegetable parasite, which, according to analogy, should spread by slow and gradual growth. I would remark, in passing, that true leprosy, a constitutional disease, will occasionally completely strip the body of hair, as we know it commonly does the face.

Again, the special liability of area to affect the lower occipital, and the regions behind the ears, and the outer portion of the eyebrows rather than, or before, the inner portion, is at least unlike anything we see in tinea tonsurans. I do not, however, regard this fact as of much value, either for or against my argument.

5.—The visible *early* changes in the skin are usually those of increased vascularity, so that the patch looks redder than the surrounding scalp; this redness is due simply to a passive dilatation of the small vessels, from impaired action of the vasomotor nerves. The increased redness is often followed by exactly the reverse appearance—an abnormal whiteness—due, in part, to the loss of pigment. At a still later stage we sometimes find a slight but distinct depression of the skin, which is the consequence of atrophy. The visible changes in the hair are well known, and are essentially those of mal-nutrition and atrophy of the bulb, with absence of pigment in the new hairs. Every one of these atrophic changes is such as we should expect to result from impaired action of the trophic nerves.

6.—Under the head of allied diseases, I would just refer to the fact that we occasionally meet with circumscribed patches of grey hair following neuralgia and other nervous symptoms, *unattended with baldness*, and which present all the appearance of area in process of recovery; and we also meet with what I would call, for convenience, traumatic area, of which our President, Mr. Erasmus Wilson, has recorded several cases where a local disturbance of nutrition has been produced by a blow, sting, or some other external cause.*

Let me briefly recapitulate the three leading features of the disease. They are: (1) a strong tendency to recur; (2) local functional nerve disturbances; and (3) various atrophic changes in the skin and hair, often of long duration. How are we to explain these facts on the parasitic hypothesis?

I would remark, in conclusion, that though I do not suppose that there are many present who believe in the parasitic origin of area, yet, as the view is widely entertained by the profession, and is also supported by a certain number of highly

* See also paper by Dr. John Collier, *Lancet*, June 11, 1881.

scientific men, such as Malassez, Eichhorst, and others, it seems to me that a congress like the present affords an important opportunity for the *diffusion* of sound views on this and other subjects, as well as for the discussion of strictly new and more technical questions.

DISCUSSION.

Dr. VIDAL, Paris, distinguished several varieties of alopecia areata—(1) *decalvans*, has a rapid course, and tends to become generalized; invades the whole scalp or a single nervous zone; (2) *pelade achromateuse* (area), in which the skin of the bald patches is pale and depressed, the surface smooth and shining, and satiny to the touch; (3) *pelade pseudo-tondante*, which might be confounded with tinea tonsurans. The hairs break off short, but are atrophied at their roots. The first form may be limited to nervous zones, or may rapidly invade the whole body. It may have as antecedents general disturbance of the nervous system, as strong emotion, terror, grief, &c., or local nervous symptoms as pruritus, hyperæsthesia, or incomplete anæsthesia. This form is never contagious and is a trophoneurosis. In the two other forms, and especially the last, he was not able to declare that they were non-parasitic, and had seen several instances of obvious contagion. He recollected one remarkable example, in which four children were attacked at intervals of about two months, and the father finally had alopecia of the beard. It is, therefore, probable that a parasite is present in this form, but he was unable to discover it; the fungus described by M. Malassez was *torula vulgaris*, which occurs in all epidermic desquamations. In sections through the scalp, parasites were not found deeper than the sebaceous glands, and never in the hair. The latter is in a condition which precisely resembles senile atrophy. M. Vidal had found pigment granules in the hair-bulb and neighbouring connective tissue, and atrophy with keratosis of the sebaceous glands. He thought the question of parasitism in certain forms could not yet be settled with certainty.

Professor HARDY, Paris, instanced several decided cases of contagion in alopecia. He thought the disease was of parasitic origin, but was divisible into two very distinct stages; an early parasitic stage, in which contagion was possible; and a secondary, neuropathic stage, in which the unknown parasite which causes alopecia has disappeared, and in which the disease is solely a trophoneurosis, contagion being no longer possible. With this view, it is possible to harmonize observations which appear at first sight contradictory. He stated further that alopecia required a certain special predisposition for its development, with the conditions of which we are as yet unacquainted.

Dr. HEBRA, Vienna, supported the hypothesis of Dr. Liveing by the case of a patient who had suffered from alopecia for ten years, and who ultimately died of pneumonia; on post-mortem examination, Dr. Jarisch found changes in the grey matter of the spinal cord.

Professor KAPOSI, Vienna, did not favour the parasitic theory, and thought it possible that there might have been an error of diagnosis in some of the contagious cases. He remembered that the late Professor Hebra and he diagnosed a case as alopecia which turned out to be tinea tonsurans. Leloir had published an account of nervous lesions in alopecia, but there was some doubt as to their truly pathological nature. He was sure that many cases occurred without any nervous symptoms or antecedents whatever.

Dr. UNNA, Hamburg, mentioned a case in which (1) epilepsy, (2) hemicrania, (3) Graves' disease, and (4) alopecia areata, all appeared simultaneously after a severe fright; and another case of alopecia areata capitis, in which, after six months' fruitless treatment, with every possible anti-parasitic and anti-neurotic remedy, treatment by the electric brush produced benefit in one week. He thought both cases supported the neurotic view.

Prof. SCHWIMMER, Buda Pesth, also believed that alopecia was a neurosis, and had seen good results from electricity, after failure of the usual irritant applications.

Dr. THIN, London, remarked that, in the great majority of cases of alopecia areata, the patches did not follow the distribution of nerves, and no pathological changes in nerve-elements had been shown to be associated with the disease. Under these conditions the neurosis theory was a simple confession of ignorance. He attributed the highest value to the cases of infection related by M. Hardy and by M. Vidal. The only escape from the conclusions forced upon us by these cases is by assuming that there has been an error of diagnosis—an assumption that, in the present instance, in view of the high authority of the reporters, was inadmissible. The possibility of contagion once admitted, the nerve hypothesis falls of itself. His examinations of the hairs in this disease had led him to believe that its cause is to be found in a bacterium, which develops between the root-sheaths and the hair-shaft, and in the hair-root, leading to disintegration of the shaft of the hair.

Prof. OSCAR SIMON, Breslau, had never found parasites, but had observed many cases with trophic or nervous derangement, and believed the disease was always a trophoneurosis, as first stated by Bärensprung. He thought the examples of contagion adduced might be explained on the hypothesis that there are two distinct diseases with the same general features; one a trophoneurosis, and the other a contagious disease.

Dr. ALLAN JAMIESON, Edinburgh, had noticed that the disease occurs specially in dark-haired persons, rarely in the fair, and scarcely ever in the red-haired. He had seen a case of morphœa, accompanied by alopecia areata, and thought that nervous symptoms predominated in the disease.

Mr. GASKOIN, London, had seen several undoubted contagious cases.

The PRESIDENT believed that there was no ground whatever for regarding area as being of parasitic origin. It was a nerve-paresis, accompanied with exhausted nutrition, and sometimes complete atrophy of the skin. The indication for treatment was not the destruction of a parasitic vegetation, but the restoration of the nerve power and nutritive power of the affected integument.

Lupus Erythematosus.

Professor KAPOSI, Vienna.

GENTLEMEN,—I have been honoured by the Committee with the task of opening the discussion on the second question of our programme, to wit: "On the Nature and the Treatment of Lupus Erythematosus."

This question should, to my thinking, be pointedly put as follows: *Is lupus erythematosus an inflammatory process or a neoplastic one?* For, the answer implies the conditions under which all that constitutes this process (as its symptoms, course, and consequences) is viewed.

In all these respects it must be stated that no agreement is to be met with amongst authors and practitioners, either in theory or in practice.

After having given, more than ten years ago, an exhaustive description of this disease, which I was pleased to see met with the general acceptance of my colleagues, I was somewhat surprised by the remarks made on the subject two years ago (August, 1879), at the Annual Meeting of the British Medical Association, in Cork, by some of our English, as well as by some of our French, colleagues.

Since the disease is known by the name of lupus erythematosus, the name itself has been an obstacle to its being correctly understood. Practitioners have always been disposed to confound it with lupus vulgaris, or at least to bring it very near the latter. Long ago I stated that, merely to make a concession to custom, I ranked lupus erythematosus among the neoplasms, next to lupus vulgaris; but I have always insisted upon its inflammatory nature, and on its being thoroughly different from lupus vulgaris.

Everyone who knows the history of this disease, and the different names formerly applied to it, must be aware that its name was not founded upon an agreement of its symptoms with those of lupus vulgaris, but merely upon the fact that, besides the generally congruent localization of both diseases in the face, they both, also, generally end in a cicatrization of the affected skin.

But what a difference in the road which either has to traverse till they arrive at this end!

I cannot now enter into an exposition of the symptoms of lupus vulgaris, which would be necessary to make my opinions perfectly clear.

You are aware that, before the publication of the plates in Hebra's "Atlas," there was only one form of the disease known—*i.e.*, the form of circular patches, sub-divided into many varieties—first, into three, by Cazenave; and that some of the older names correspond to it, as—Erythema centrifuge, dartre rongeante, qui détruit en surface, &c. In the plates mentioned two forms are depicted, which I show here: one, representing the circular form in its localization on the nose and the cheeks, compared to a butterfly-shape; and on the other plate, a disease consisting of discrete and lentil-sized patches of an otherwise well-pronounced character. But none—not even Hebra himself—made any distinction between them. Nor do I. On the contrary, I have for a special purpose taught that the process generally begins by the small spots, which I have called the "primary eruptive spots" (*primar-efflorescenzen*) of lupus erythematosus.

I need not fully describe these spots before a meeting of professional brethren; but I merely state that every spot is characterized by a red, elevated, hyperæmic, and infiltrated border, and a central cicatrix-like depression, smooth, or covered with a dry, firmly-adherent scab.

But as to the further development of the process, I have been compelled to distinguish two forms, which I have designated—1st, as lupus erythematosus *discoides;* and 2nd, as lupus erythematosus *aggregatus*.

The *discoid* form, which results from the spreading of single spots peripherally, is generally characterized by an exceedingly chronic course, not only of the individual patches, but also of the process as a whole. Further, it is usually

confined to the region of the face and the head (including the mucous membrane of the mouth) occasionally attacking the fingers also.

Even in this form, the clinical symptoms are easily recognized as belonging to an inflammatory process. This is strikingly expressed in the attribute "congestiva," which Hebra originally applied to the disease, and may be seen from the disappearance of the redness under the pressure of the finger, and its reappearance when the pressure has ceased; from the character of the infiltration, from the quick outbreak of hyperæmia, and its frequent disappearance without any trace; and last, not least, from the symptoms of very high and acute inflammation which occasionally complicate the discoid form, but which emphatically belong to the second form of the disease.

In the latter, to wit, in lupus erythematosus aggregatus, the symptoms of inflammation are far more striking.

Even in the lowest state of the disease, which has been called seborrhœa congestiva, from its character (congestion and its consequence, abundant secretion of the sebaceous glands), no doubt can arise concerning its inflammatory nature. So it is also in the other forms of eruption.

Patches, of the size of a pin's head or a split lentil to that of a finger-nail arise suddenly, slightly elevated, hyperæmic, hot and hard to touch, paling under pressure, burning; in brief, on the whole, not unlike urticaria spots, or those of erythema urticatum, or the first stage of eczema. As yet there is nothing characteristic of lupus erythematosus. There may appear single ones, 20–100 and more, crowded in the face, or dispersed in other parts of the body. Many of these spots may disappear in the course of a few days without leaving any trace behind, while some of them remain and become characteristic by the atrophic depression of the centre.

It is known that what I have called lupus erythematosus aggregatus consists of such forms, and that the disease does not spread in this variety by increase of individual spots, and their transformation into disks, but by the augmentation of the number of single spots, which are crowded locally into large uniform patches, and in their dispersion over large parts of the body.

Every outbreak of this kind may be accompanied by higher degrees of inflammation and exudation of the skin so as to form crusts and scabs, as in eczema; or even blebs, as in herpes and pemphigus, with serous, purulent, or hæmorrhagic contents.

I must not forget to call your attention to the inflammatory and painful tumours, which I have described as arising acutely in the depths of the subcutaneous cellular tissue, in the joints, and in the glands, over which, after a few days, patches of lupus erythematosus are formed, while this deep infiltration disappears, and, above all these, to the state of inflammation of the face, which I have described and designated as *erysipelas perstans faciei*, which often leads to death.

I find it superfluous before such an audience to further detail the clinical symptoms, all pointing to an inflammatory process.

The same thing is proved by the result of anatomical investigations which have been made by Neumann, Geddings, Thin, Stroganow, Geber, and others, and by myself.

Whereas it was formerly believed that there was merely an inflammation of the sebaceous glands and their adjacent tissue, I was able to show that the anatomical changes belonging to inflammation may be found in any layer of the skin, superficially, or more deeply; and that very often they are met with in the depths of

sweat-glands, spreading from there, along the blood vessels, into the papillar layer of the skin. Also the hæmorrhages, the formation of blebs and pustules above mentioned, are among the symptoms of the inflammatory congestion and changes of the blood vessels, whereas the numerous telangiektases, which are apt to remain at the very place of the lupus patches, are merely a consequence of the cicatrization, as may happen also in cicatrices of other origin.

To further penetrate into the nature of the process, we must inquire: *What kind of inflammation it is which so rapidly leads to the cicatrization of the skin?*

This question must be divided into two parts. First, *What is going on locally?* And in the second place, *What remote causes may underlie the process?*

As to the first, I may affirm that this is not a cicatrix, properly speaking, but a local atrophy of the skin.

I have demonstrated in my publications of 1870, that in the midst of the inflammatory changes of the tissues, and at a very early stage, fatty and molecular cloudiness of the cells of the rete and the glands, and of the formed elements resulting from inflammation, makes its appearance. A similar, or a hyaloid, or a waxy degeneration takes place in the connective tissue elements of the papillary layer, and of the blood vessels, in consequence of which they in part become absorbed, and in part shrivel up, whilst the follicules also disappear, the blood vessels become partly dilated, partly obliterated; briefly, all the symptoms of cicatricial degeneration and atrophy, including telangiektases, are to be recognized.

But for us it is essential to remember that many other processes of an inflammatory character and of cellular infiltration end in cicatrization; or, rather, in cicatrix-like atrophy, as scleroderma, lichen ruber, lichen scrophulosorum, and others; whereas, the true cicatrix is the organized product of granulation—that is, of a neoplasm.

The remote cause may also be considered as belonging to the *Ætiology* of the disease.

To me it is obvious that in many cases the affection has begun as a local disease, and runs its whole course locally, without in the least afflicting the constitution during the whole duration of the malady. I remember cases in which lupus erythematosus has proceeded from a seborrhœa of the nose and the face, which had its recent origin in the scars of small-pox. In those cases there is not the least inducement to consider it as a constitutional disease.

I mention another fact, which has been also pointed out by others, that two-thirds of the cases of lupus erythematosus are to be met with in females, and that the latter are mostly chloranæmic. But this is by no means peculiar to lupus erythematosus, which, moreover, frequently occurs in healthy females, and also in men.

But, undoubtedly, we must affirm the existence of a decided sympathy of the whole organism in those stages, which I have called acute general eruption of lupus erythematosus.

There is no doubt that the high fever, the symptoms of pressure on the brain, the typhoid state, the vomiting, the pleuro-pneumonia, the delirium, sopor, and the convulsions which we have observed in such cases, are in immediate relation to the inflammatory process of the skin; as also the affections of the joints, the bones, the glands, the erysipelas perstans faciei—in short, the outbreak—and to the exacerbation of characteristic lupus spots.

Of course, here we might ask: *Whether the eruption is a consequence of a disorder of the nervous centres, or the reverse?*

Although I think I have seen more autopsies in connection with this di than anyone else, yet I could not give a decided opinion.

I have observed 8 cases of death in the number of 53 cases of lupus eryt tosus (18 men, 35 women) treated in the Vienna Clinic in the course of ten 1871–1881. Amongst these eight cases were 2 men, 6 women.

The autopsies have shown in six cases pleuro-pneumonia; in two cases, tu losis pulmonum as immediate causes of death. Besides that, atrophy c cortical substance of the brain and œdema of the meninges (once mar and anæmia) has been noticed. In a case of lupus erythematosus acutus, fat year, Jarisch has found inflammatory changes in the middle lateral parts anterior cornua of the medulla, as well as in its commissure. But neither thi nor the results of investigation we have made in a case of lupus erythem acutus, fatal during this year, of the medulla spinalis, the intervertebral gar and those of the sympathicus of the neck, could as yet authorize us to the c that the primary cause of the disturbance lies in the hypothetic trophic c or in the centre of vasomotor nerves.

On the other hand, it is not unusual for us to see, that in consequence doubtedly local diseases of the skin, as burns, cauterization, loss of epiderm great extent from any cause, the severest symptoms of fever, of nervous di singultus, convulsions, sopor, vomiting, and even death may ensue.

I am not inclined to interpret these symptoms otherwise, than that they provoked by reflex action from the affected skin. We are taught to do so b other observations made in Dermato-pathology; and we find this opinio more convenient than that of neuritis ascendens.

Still, there remains a wide field for the theory of general repression of nu which may cause the degenerative character of the inflammation. But ne such a state of general weakness to be found in all cases, nor can it expl outbreak of the inflammation itself.

Before closing, in regard to the pathology of the disease, I submit anoth tion: *Whether my division of lupus erythematosus does not most correspon clinical features?* For, to me, it seems that the subdivisions according to morphological differences—as, erythematosus, or hæmorrhagic, or acnéic— touch any of the essentials, while my division of discoid and aggregate, making no difference as to the origin, still indicates the twofold manner of the process; one chronic and indifferent, and the other acute, severe, and even

Now I pass to the practical question of the best *treatment*. On this I short.

The general and etiological conditions have given us no indications for a cious treatment. For, whatever generally invigorating remedy is given, cod-liver oil, strengthening diet, &c., it has no direct influence on the disease. iodine with starch, recommended by McCall Anderson, and the iodiform, a in two cases by our distinguished friend, E. Besnier, I have no sufficient exp That the anti-syphilitic therapeutics are of no use at all I have amply exp

On the other hand, we are, as you are aware, very rich in external a remedies. To the all but exhaustive number I published in 1869, I may a add a few new ones, as sublimate-collodium, salicylic acid, pyrogallic ac sarobin, iodoform and naphthol, lately introduced by me.

Further, I can but repeat my former words, that each remedy and m procedure may be found thoroughly efficacious in lupus erythematosus, this statement only applies to particular cases, since a method which has

to the test in a number of cases successfully, will leave us in the lurch in the very next case.

In judging of the efficacy of any remedy, we must not forget that the patches of lupus erythematosus very often disappear spontaneously, or under the slightest influences.

Of the large number of well-known remedies, all of which may be useful in special cases, the application of cold not excepted, I have in my experience found as most efficacious, soaps in all forms, especially spiritus saponis alkalinus, dilute acids and alkalies, tar, sulphur, and iodine; most particularly emplastrum hydrargyri, which I have first applied successfully; sometimes pyrogallic acid; lastly, naphthol; finally, mechanical treatment by puncturing, scraping with a scoop and scarification, which are most useful in destroying the disfiguring teleangiektases, which very often remain on the spots of lupus erythematosus which have recovered.

Lupus Erythematosus.

Dr. Th. Veiel, Canstatt.

Hochverehrte Versammlung! Der liebenswürdigen Aufforderung unserer hochverehrten englischen Collegen folgend, beehre ich mich, Ihnen in Kurzem, meine Ansichten über die Natur und die Behandlung des Lupus erythematosus mitzutheilen.

Unter Lupus erythematosus verstehe ich selbstverständlich den Lupus erythematosus Cazenave's oder "der Deutschen" wie ein Theil unserer englischen Collegen ihn im Gegensatz zum Lupus erythematosus der Engländer nennt, welcher die leichteste Form des Lupus vulgaris bildet.

Fünf und fünfzig Fälle dieser Art wurden in der von meinem Vater begründeten, von meinem Bruder Dr. Ernst Veiel und mir geleiteten Heilanstalt für Hautkrankheiten in Canstatt behandelt.

Der Verlauf in allen diesen Fällen war ein chronischer, die Form meist die scheibenförmige, seltener die disseminirte, der Sitz meist Nase, Wangen, Augenlider, Ohren und der behaarte Kopf.

Meist war die Krankheit zwischen dem zwanzigsten bis vierzigsten Lebensjahre aufgetreten, nur in zwei Fällen unter zehn Jahren, in einem nach dem sechzigsten Lebensjahre.

Jene bösartige, von Kaposi, Stern und Bock beschriebene, mit acuten und subacuten, fieberhaften Eruptionen auftretende, über den ganzen Körper zerstreute Form von Lupus erythematosus aggregatus habe ich in Canstatt nie gesehen, wohl aber im Jahre 1872 auf der Klinik meines leider zu früh verstorbenen hochverehrten Lehrers, Hebra in Wien.

Folgende Fragen habe ich mir für heute in Betreff der Natur des Lupus erythematosus zur Beantwortung vorgelegt:—

1.—Ist der Lupus erythematosus eine Krankheit eigner Art oder bildet er nur eine Unterabtheilung des Lupus vulgaris?

2.—Ist der Lupus erythematosus eine Theilerscheinung einer uns bekannten Allgemeinerkrankung des Organismus wie der Scrophulose, Tuberculose, Gicht und Syphilis?

3.—Bildet die Erkrankung der Talgdrüsen resp. der Schweissdrüsen, wo keine Talgdrüsen vorhanden sind, das Wesen der Krankheit?

Die Antwort auf die *erste* Frage lautet; der Lupus erythematosus ist eine selbst

ständige Krankheit nach seinem ersten Auftreten, seinem Ansehen und s
Verlaufe.

Dafür sprechen folgende Gründe: die verschiedenen Formen des Lupus v
gehen häufig in einander über, aus einem Lupus erythematosus wird nie ein
vulgaris. Ein gleichzeitiges Vorkommen beider Erkrankungen bei demselbe
dividuum wurde meines Wissens noch nie beobachtet.

Der Lupus erythematosus tritt in kleinen, *oberflächlichen*, rothen Punkte
auf denen sich fest adhärirende Schuppen bilden, welche zapfenartige Fo
zwischen die verlängerten Papillen entsenden. Der Lupus vulgaris beginn
tiefer in der Cutis gelegenen, kleinen, bräunlichen Knötchen.

Der Lupus erythematosus geht nie in Erweichung, Vereiterung und
schwärung über. Nie bildet er Knoten, wie der Lupus vulgaris.

Der Lupus erythematosus bleibt stets auf die Cutis und das Unterhautzell
beschränkt. Tiefer liegende Gebilde wie die Knorpel ergreift er nie.

Der Lupus erythematosus ist fast stets eine Krankheit des reiferen Alte
Lupus vulgaris tritt nicht vor der Entwickelung der Mannbarkeit auf.

Die *zweite* Frage wäre dahin zu beantworten:

Wenn es auch nicht zu leugnen ist, dass der Lupus erythematosus häu
bunden mit Scrophulose, Tuberculose, Gicht und Chlorose vorkommt u
Patienten sehr oft ein anämisches Aussehen zeigen, so ist dies doch keinesw
Regel. Sehr häufig trifft man ihn bei ganz gesunden Menschen.

Obschon sich also auch eine Verwandschaft mit obigen Erkrankungen,
mit der Scrophulose und Tuberculose nach den von Kaposi beschriebenen, t
verlaufenen Fällen vermuthen lässt, der Nachweis ist noch nicht erbracht.

Mit Syphilis hat der Lupus erythematosus gar nichts gemein und lass
alle antisyphilitischen Kuren bei der Behandlung desselben im Stiche.

In Betreff der *dritten* Frage, ob die Erkrankung der Talg- resp. Schweis
den Lupus erythematosus bilden, habe ich schon im Jahre 1872* dargetha
wenn auch in vielen Fällen die Erkrankung der Talgdrüsen dem Bilde des
erythematosus einen ganz besonderen Charakter verleiht, doch die Erkrank
Talgdrüsen nur eine accidentelle ist, eine Ansicht, die seit dieser Zeit die
kopischen Untersuchungen von Geber, Thin, und Vidal mir bestätigt haben

Das primäre und wesentliche der Erkrankung ist eine Anhäufung von
perchen in den erweiterten Capillaren des Papillarkörpers und des Corium
Zelleninfiltration in der Umgebung der Gefässe. Diese Veränderungen las
zu einer Zeit nachweisen, wo Talg- und Schweissdrüsen noch vollständig int
Die Erkrankung der Drüsen ist die Folge der Erkrankung des sie reich
spinnenden Blutgefässnetzes.

So erklärt es sich auch, dass in einzelnen Fällen die akute Dermatitis der
in anderen Fällen die des Erysipelas, die erste Veranlassung zur Entsteh
Lupus erythematosus giebt. Je nach der secundären Betheiligung der Ta
an der Erkrankung sind die Bilder des Lupus erythematosus verschieden.
die reichlichen Antheil, so fühlt sich die Haut fettig an, die kranken Ste
mit talgreichen Krusten und Schuppen bedeckt, nehmen sie geringen
keinen Antheil, so bildet sich von Anfang an eine spröde, harte, ho
fettarme, verdickte Epidermisschichte.

Für die Ansicht, dass die Erkrankung der Gefässe und ihrer Umge

* Th. Veiei, "Ueber Lupus Erythematosus." Tübingen.

Primäre ist, spricht auch der Umstand, dass die Prädilektionsstellen des Lupus erythematosus gerade diejenigen sind, an welchen Stauungen und Gefässerweiterungen auch bei anderen Erkrankungen vorkommen, so Nase und Wangen bei Acne rosacea und Erfrierungeu, Ohren und Rückenfläche der Finger und Zehen bei den Erfrierungen.

Die von Oscar Simon* gegen diese Ansicht angeführte Beobachtung, dass in einer Brandnarbe in welcher die Follikel zu Grunde gegangen waren kein Lupus erythematosus auftrat, während in der Umgebung derselben sich ein solcher bildete, dürfte wohl zur Widerlegung nicht vollständig ausreichen, da in einem Narbengewebe neben den Follikeln auch der Papillarkörper des Corium und das die Follikel umspindende Gefässnetz zu Grunde gegangen ist. In jungen gefässreichen Narben sehen wir sehr häufig Recidive entstehen, selbst wenn sie von sehr tief wirkenden Aetzmitteln, wie vom Aetzkaligriffel herrühren, wobei voraussichtlich auch die Follikel zerstört worden sind.

Nach diesen Ausführungen, glaube ich, sollten alle die Bezeichnungen des Lupus erythematosus, welche sich auf die Erkrankung der Talgdrüsen beziehen, aufgegeben werden, wie der Lupus acneiformis (Tilbury Fox), Lupus acnéique (Hardy), Lupus seborrhagicus (Volkmann), wie dies Hebra in Betreff der Seborrhoa congestiva schon früher gethan hat.

Gehen wir nun zur Behandlung des Lupus erythematosus über, so müssen wir vor allem vorausschicken, dass es einzelne, zum Glück seltene Fälle, von Lupus erythematosus giebt, die jeder, auch der energischsten Behandlung spotten, indem sich, in den durch die Behandlung gebildeten Narben, stets Rückfälle bilden.

Folgende beide Fragen habe ich mir zur Beantwortung vorgelegt:—

1.—Ist neben der örtlichen Behandlung auch eine allgemeine Behandlung des Lupus erythematosus angezeigt und worin hat dieselbe zu bestehen?

2.—Welches Mittel hat sich bei der localen Behandlung am besten bewährt?

Ad 1.—Es ist uns noch nie gelungen einen Lupus erythematosus durch Darreichung anderer Mittel zur Heilung zu bringen. Es giebt kein Specificum gegen diese Krankheit; Jodkali und Arsenik haben uns stets im Stiche gelassen. Ueber die von M'Call Anderson empfohlene Jodstärke stehen uns noch keine genügenden Erfahrungen zur Seite. Dennoch möchte ich, besonders seit dem Bekanntwerden der schweren, tödtlich verlaufenden Fälle nicht darauf verzichten, den Gesammtorganismus des Kranken möglichst zu kräftigen. Sind Symptome von Scrophulose, Tuberculose, Gicht, Chlorose vorhanden, so richten sich die Heilmittel nach diesen Indicationen. Wo diese nicht vorhanden und auch aus Gründen der Erblichkeit nicht zu fürchten sind, müssen wir uns auf die Darreichung möglichst kräftiger Kost und guter Luft beschränken.

Ad 2.—Die Wahl des örtlichen Mittels richtet sich nach den einzelnen Fällen. Von den vielen empfohlenen Mitteln haben sich uns die folgenden am wirksamsten gezeigt:—

Bei kleineren umschriebenen Flecken des Lupus erythematosus sebaceus ist das schon von Casenave empfohlene Quecksilberjodid (in einer Stärke von 1 : 5—15 Fett) von ausgezeichneter Wirkung. Dasselbe wird nach Entfettung der Haut so lange aufgetragen bis sich mit Eiter gefüllte Blasen gebildet haben. Die Krusten lässt man eintrocknen und abfallen. In einzelnen Fällen ist die wiederholte Anwendung dieses allerdings schmerzhaften Mittels nöthig.

Kräftiger und besonders bei dem Lupus erythematosus corneus sehr empfehlens-

* "Localisation der Hautkrankheiten," p. 100.

werth wirkt die *Chloressigsäure.* Sie zeichnet sich aus durch rasche, nicht gehende Wirkung, geringe Schmerzhaftigkeit, genaue Beschränkung ihrer W auf die Anwendungsstelle, geringe Entzündung in der Umgebung des Aetzs und glatte Narbenbildung. Sie ist den meisten anderen Säuren entsc vorzuziehen. Sie wird mit einen Glaspinsel aufgetragen und dann mit Glasstift in den Schorf eingebohrt.

Bei grösseren Flächen ziehen wir obigen Mitteln die von Jarisch empf *Pyrogallussäure* vor. In Salbenumschlägen (1 : 10 Vaselin) wird sie drei od Tage aufgelegt, der Erfolg nach Abtheilung des Schorfes ist oft ein geradezu raschender.

Führt keines der obigen Mittel zum Ziele, so gehen wir mit Umgehu Ausschabungsmethode mit dem scharfen Löffel, nach welcher sich stets Rückfälle bilden, zu der tiefer wirkenden *multiple Scarification* mit n gender Chlorzinkätzung über. Ohne die Aetzung sind die Erfolge so Sie wird bei uns ausgeführt mit dem von meinem Bruder 1873* angeg jetzt verbessertem, aus sechs nebeneinander stehenden Lancetten beste Instrument. Nach Stillung der Blutung wird eine concentrirte, spirituöse zinklösung eingepinselt. Wegen der grossen Schmerzhaftigkeit wird bei kl Stellen die locale Anästhesie mit dem Richardson'schen Aetherzerstäub beigeführt; werden grössere Stellen scarificirt, so muss chloroformirt werde

Fassen wir zum Schlusse das Ergebniss obiger Ausführungen zusamm lassen sich folgende Sätze aufstellen :—

1.—Der Lupus erythematosus ist eine selbstständige Krankheit und nic Form des Lupus vulgaris.

2.—Ein Zusammenhang des Lupus erythematosus mit Scrophulose, Tub und Syphilis lässt sich nicht nachweisen.

3.—Die Erkrankung der Talgdrüsen, resp. Schweissdrüsen bildet eine s Begleiterscheinung. Das Wesen des Lupus erythematosus bildet die Erkr entlang dem Verlauf der Blutgefässe.

4.—Es ist bis jetzt kein Mittel bekannt, das, innerlich gereicht, den erythematosus zur Heilung bringt.

5.—Das wirksamste örtliche Mittel gegen den Lupus erythematosus multiple, mit nachfolgender Chlorzinkätzung verbundene, Scarification.

DISCUSSION.

The PRESIDENT considered the affection inflammatory, arising after exp irritating influences. It begins as an erythema, which becomes perman finally lupoid. He cited the case of a woman in whom, during pr erythema appeared on the face; then, after exposure to cold, the erythem over the trunk, and in the end became lupus erythematosus.

M. VIDAL, Paris, believed the disease not to be inflammatory, but to be diate between inflammation and neoplasm. It is cured by producing infla of the patches. In the superficial forms the lesion extends only in the su papillary layer. Embryonic cells, like those present in lupus vulgaris, are the deeper forms. He recommended treatment by *spiritus saponis alkali* the best treatment is scarification, and then, to obtain inflammation, *de Vigo.*

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* "Archiv. für Dermatologie und Syphilis."

Dr. UNNA, Hamburg, remarked that clinically we can distinguish between inflammation and a neoplasm, but that in lupus erythematosus we cannot even clinically draw the line. We have a disease, which is at first inflammatory, and eventually becomes a new growth.

Professor SCHWIMMER, Buda-Pesth, believed that the disease was purely local and inflammatory.

Dr. THIN, London, observed that the disease was essentially distinct from lupus vulgaris, and that it was inflammatory, and not a neoplasm.

Ueber Leukoplakia buccalis.

Professor ERNST SCHWIMMER, Buda-Pesth.

Die Erkrankung der Mundhöhlenschleimhaut bildet entweder eine Theilerscheinung einer allgemeinen Erkrankung oder sie stellt eine ganz selbständige Affection dar, welche dem Character des Mutterbodens entsprechend von den Krankheiten der Haut mit welchen man sie zu vergleichen liebt, wesentlich differiren, wesshalb man auf selbe auch nicht solche Bezeichnungen anwenden soll, welche für typische Affectionen der allgemeinen Decke gebräuchlich sind. Den meisten Anlass für das Entstehen der Schleimhautaffectionen bieten die syphilitischen Prozesse im allgemeinen, und es ist bekannt, dass in gewissen Phasen des Allgemeinleidens Zungen- Wangen- und Rachenschleimhaut characteristische Veränderungen darbieten, welche seit langer Zeit als "Plaques opalines" u. s. w. belegt werden. Wir wollen aus der grossen Reihe der Veränderungen, welche in der Mundhöhle auftreten, nur jene Formen speciell hervorheben, welche vermöge der Localität der Erkrankung und ihrer äussern Form gerade mit den Syphiliden der Schleimhaut eine so frappante Aehnlichkeit haben, dass man häufig in die Versuchung kommt, diese Affection immer nur als eine specifische zu betrachten. Zahlreiche Aerzte begehen in solchen Fällen einen beklagenswerthen Irrthum und da bekanntlich die Syphilis oft nur durch eine einzelne Symptomengruppe diagnosticirt werden kann, so genügt es, eine oder die andere von den zu beschreibenden Veränderungen in der Mundhöhle wahrzunehmen, um auf falscher Diagnose fussend, auch eine nicht entsprechende Therapie einzuleiten.

Die characteristischen Veränderungen der idiopathischen Affectionen, die ich zum Ausgangspunkte meiner Schilderung nehme, entwickeln sich in Form von rothgefärbten, umschriebenen Flecken, welche sowohl auf der Zunge, dem Innenrande der Lippe und der Wangenschleimhaut auftreten können und eine umschriebene Hyperämie darstellen. Die Dauer dieser Veränderung ist eine ungleiche und kann von einigen Wochen bis zu einigen Monaten anhalten um sich entweder wieder rückzubilden oder zu weiterer Umwandlung zu entwickeln, wobei statt der rothen Flecke, umschriebene grauliche oder weisse Verfärbungen sich bilden. In einer ähnlichen Weise kommt bei der Syphilis die Schleimhauterkrankung zu Stande, indem aus hyperämischen Bezirken auch weissliche Verfärbungen sich herausbilden, nur mit dem Unterschiede, dass die Umwandlung des Epithels viel rascher erfolgt als bei der idiopathischen Erkrankung. Letztere zeigt eine grössere Widerstandsfähigkeit gegen jene Einflüsse, welche auf die kranke Mundschleimhaut nachtheilig einwirken können, und während bei der Syphilis theils spontan, theils durch

Behandlung leicht eine Rückbildung der Erkrankung erfolgt, ist dies bei der andern Form nicht in der Weise zu beobachten, im Gegentheil, die erkrankten Epithelschichten beginnen sich allmälig zu verdicken und man findet nach und nach auf der Schleimhaut der Zunge und der übrigen Mundhöhle allmälig dickere in's Gewebe reichende Massen, welche der erkrankten Oberfläche ein verdicktes und schwartiges Aussehen verleihen. Die Ausbreitung der Erkrankung ist eine ungleichförmige, indem man bald rundliche, bald elliptoide Stellen, bald wieder längliche Platten und Streifen bildende Auflagerungen findet. Am häufigsten ist die Zunge dieser Erkrankung unterworfen, sowie die Uebergangsfalten der Mundwinkel; an den Lippen findet man selbe seltener so ausgeprägt. Der ganze Prozess ist durch Infiltration des Coriums und bedeutender Zellenwucherung in dessen einzelnen Lagen characterisirt und dies erklärt auch die grössere Persistenz dieser Plaques und deren Umwandlungsfähigkeit zu anderen Prozessen. Einzelne Autoren haben die Affection, was deren idiopathischen Character anlangt, als Psoriasis oder Keratosis membranæ mucosæ beschrieben und der grösste Theil der Aerzte neigt der Ansicht zu, dass dieses Leiden stets auf syphilitischem Boden sich entwickelt. Dies ist jedoch, in solcher Allgemeinheit hingestellt, nicht der Fall und den besten Massstab für die Unterschiede beider Affectionen liefert der Verlauf und Ausgang der Erkrankung selbst. Man beobachtet nämlich in einzelnen Fällen eine Rückbildung des Krankheitsprozesses, wenn das Uebel frühzeitig erkannt wird und die Schädlichkeiten hintanzuhalten sind, welche eine Verschlimmerung des Zustandes veranlassen; in andern Fällen kommt es wieder zu bösartigen Wucherungen mit Ausgang in Carcinom, wie dies von Chirurgen häufig zu beobachten ist. Ich habe schon vor mehrern Jahren auf das Wesen dieser idiopathischen Erkrankung hingewiesen und auf die diagnostische Wichtigkeit derselben aufmerksam gemacht und vorgeschlagen dieses Uebel, wegen der präcisen Beurtheilung, *Leukoplakia* (λευκὸς weiss, πλὰξ Fläche) zu benennen. Während ich früher aus einer grossen Reihe von Schleimhautaffectionen auf 20 diesfällige Beobachtungen mich stützte, bin ich heute in der Lage auf 50 einschlägige Fälle mich zu berufen. Meine Auffassung in Bezug auf die histologischen Untersuchungen lehrte mich, dass die Zellwucherung ringsum die Gefässe beginnend, den Anlass zur Ausbreitung und Persistenz des Prozesses bildet und die kleinzellige Granulation von da aus ihre hauptsächlichste Nahrung findet. Dieses Verhalten unterscheidet sich auch schon von den bei den syphilitischen Producten nachweisbaren Zellinfiltrationen, indem daselbst die Blutgefässe nicht in dem Masse von Zellen durchsetzt werden, sondern mehr die obern Corium- und Papillarschichten infiltrirt sind, wenngleich hier wie dort die kleinzellige Wucherung aufzufinden ist.

Als ætiologisch wichtig fand ich in allen Fällen, entweder Erkrankungen von Seite des Verdauungstractes oder vieles Rauchen und Genuss starken Tabaks zu beschuldigen; die Syphilis selbst kann auch als constitutionelles Moment dienen, indem selbe namentlich die Disposition zu einer derartigen Erkrankung abgibt. Besonders letzterer Umstand macht die Schwierigkeit in der Beurtheilung einzelner Fälle so bedeutend. Doch zeigt eben die Therapie, dass die idiopathischen Prozesse einer antisyphilitischen Cur eben nicht weichen, sondern in ungeschwächter Stärke fortdauern.

Betreff der Therapie fand ich in erster Linie Vermeidung aller Schädlichkeiten, welche die kranke Schleimhaut noch mehr zu reizen vermögen, insofern von günstiger Einwirkung, als ein Fortschreiten des Prozesses hierdurch verhindert werden kann. Pflege und Reinhaltung des Mundes sowie der Gebrauch alcalischer

Mundwässer erscheint von grossem Vortheil. Irritirende Behandlung durch starke Aetzmittel zeigte sich im Allgemeinen nicht günstig, hie und da pflegt eine starke Lapislösung für kurze Zeit Ruhe zu schaffen, dauernde Heilung sah ich durch dieselbe nie. Desto günstigere Wirkung fand ich jedoch durch örtliche Behandlung mit einer ½ % Sublimat- oder einer 1 % Chromsäurelösung und ich verfüge über eine grössere Reihe von Fällen, wo hierdurch eine anhaltende Besserung erzielt und der Uebergang in die maligne oder krebsartige Form verhütet werden konnte.

DISCUSSION.

Dr. Hillairet, Paris, agreed with Prof. Schwimmer. The disease is not really psoriasis. He had seen many cases in the last twenty years, and considered their etiology obscure; the abuse of tobacco is, doubtless, a common cause. It occurs in both syphilitic persons and those who have never suffered from this disease. It is often the starting-point of epithelioma, is most obstinate, and even incurable. The best results in alleviation are obtained by the application of chromic acid (1 to 8), repeated for three or four days in succession, and subsequently at greater intervals; the mouth should also be frequently washed out with an alkaline solution, such as Vichy water.

Professor Kaposi, Vienna, called attention to the distinction between the earlier and later stages; he had called the latter, in 1866, *keratosis mucosæ oris*. It might become epithelioma, not because the latter is due to syphilis, but because we have to do with epithelial hyperplasia supervening on a chronic inflammation, which leads to atrophy of the mucous membrane, He does not deny that similar affections exist, due to other causes than syphilis—as gastric derangement, diabetes, anæmia—among which he has seen cases with hyperæsthesia of the tongue; but he would like to know what are the differential characters between Schwimmer's non-syphilitic leukoplakia and the affection which he himself regards as having a syphilitic origin. No distinction can be drawn by the results of treatment, as it is certain that anti-syphilitic medication is without influence in cases of undoubted syphilitic origin.

Dr. Vidal, Paris, said that Leukoplakia buccalis was the best name for the disease, which had nothing to do with psoriasis, ichthyosis, &c. He considered it an idiopathic affection distinct from the chronic glossitis of smokers, and from syphilis. It was characterized by pearly white patches, with abundant flaky desquamation, and by more or less deep and ulcerated fissures; microscopic examination shows flattening of the papillæ, dilatation of blood-vessels, and proliferation of embryonic cells in the corium, especially its upper layers. It does not occur exclusively in smokers, and he had seen cases in women. It may be compared to the chronic desquamation which sometimes precedes for several years epithelioma of the face. Leukoplakia in its later stages may become complicated with papillomatous growths, and should be looked upon as the first stage of epithelioma, but is very slow, like the flat rodent ulcer, which may remain localized for more than twenty years. Chronic superficial glossitis, due to tobacco, is less desquamative, and more commonly accompanied by lesions at the commissures of the lips and inner surfaces of the cheeks. It may be cured by complete abstinence from smoking. Syphilitic lesions have special characters; desquamation is less abundant, and the epithelium cannot be removed in flakes, as in idiopathic

leukoplakia; the surface of the tongue has been well described by Fairlie Clarke as separated into islands by longitudinal and transverse depressions, which are mostly not ulcerated; the tongue feels indurated on palpation, which is not the case in idiopathic leukoplakia. But diagnosis is difficult when we have the three conditions combined; in a person predisposed to idiopathic leukoplakia (nearly always a rheumatic or arthritic subject) who is suffering from dyspepsia, we may find that smoking gives rise to superficial glossitis, which may develop into leukoplakia. This may be diagnosed if the lesion persists five or six months after giving up tobacco. In syphilitics, the sensibility of the mucous membrane is greater, and in these, also, the irritation of smoking will lead to the localization of syphiloma. Abstinence from tobacco, and a prolonged antisyphilitic treatment, will lead to gradual amelioration and even cure. Mercurials are most serviceable and useful in differential diagnosis, as they are without influence on the early stages of leukoplakia, are often injurious in the more advanced forms, and are invariably so when there is a distinct epitheliomatous tumour. When this has been developed, surgical treatment by removal is our only resource.

Mr. Morrant Baker, London, expressed his general concurrence with Professor Schwimmer's views. The affection was first described in this country by Mr. Hulke, and was familiar to English surgeons. It is not syphilitic, nor does it at all closely resemble it; but it is too often diagnosed as syphilitic. It is, perhaps, not too much to say that not one case in ten of those chronic affections of the tongue which are hastily diagnosed as syphilitic are really due to this disease. Syphilis is, of course, one of the causes of the glossitis to which these very long-standing affections owe their origin, but it is not the most frequent.

Mr. Clement Lucas, London, said the affection was known in England as ichthyosis, or psoriasis—both bad terms, as the affection bore no relation to the above-named skin diseases. Professor Schwimmer admits syphilis as *one* of the causes of the idiopathic affection; when this is the case there has generally been recurrent superficial ulceration for years from the secondary stage; this may continue for five to thirty years before the white patches become permanent. The buccal ulcers are at first influenced by potassium iodide, but the later stages can only be treated locally. Smoking is the common cause of the syphilitic affection becoming chronic, and mercury often helps to keep it up. Smoking, alone, may also be the cause of leukoplakia, and, further, the presence of foul teeth. He showed two drawings, representing white patches on the cheeks and hard white patches on the tongue; in the first there was no syphilis, and the affection originated in bad teeth; the second, which was precisely similar, was taken from a patient who had syphilis nineteen years ago, and had a child with distinct marks of the disease. A circular ulcer on the tongue yielded to potassium iodide, but the white patches remain. The importance of leukoplakia is that it terminates in epithelioma; it is the result of chronic irritation, and although it may be idiopathic, we must admit syphilis to be one potent cause of its production.

Dr. Behrend, Berlin, agreed with Professor Schwimmer as to the existence of an idiopathic affection of the oral mucous membrane, as described by him, which has nothing to do with syphilis. He considered it syphilitic before Professor Schwimmer's paper on the subject appeared, but was surprised at the inefficacy of all specific treatment, and was obliged to have recourse to caustics. He mentioned the

case of a friend of his who contemplated marriage, but feared, although there was no history of infection, that he was syphilitic, owing to the presence of opaque white patches at both angles of the mouth, and on the inner surface of the lower lip. A long and careful local and general mercurial treatment produced no improvement. It was then discovered that the affection had appeared soon after the insertion of a set of false teeth; on ceasing to wear these the patches rapidly healed, but returned again on the false teeth being resumed.

Dr. L. Duncan Bulkley, New York, remarked that the affection had been long recognized in the United States as distinct from syphilis, and many cases had been shown at the New York Dermatological Society. The term leukoplakia had been used in the *Archives of Dermatology* about five years ago, but might have been taken from Dr. Schwimmer. Dr. Weir, of New York, and others, had written on this affection. He himself considered the affection might be quite distinct from syphilis, and certainly it had no connection with ichthyosis, or psoriasis of the skin.

The President observed that the Section was indebted to Professor Schwimmer for directing attention to leukoplakia buccalis. The formation of blotches of white epithelium was well known to us as a frequent complication of syphilis, and such patches yielded with facility to the syphilitic treatment. But idiopathic leukoplakia remained entirely uninfluenced by syphilitic treatment, and exhibited a tendency to take on those further changes of cell growth and development which were apt to issue in epithelioma.

Professor Schwimmer, Buda-Pesth, in reply, stated that he had first described leukoplakia buccalis in 1877, in the *Vierteljahresschrift für Dermatologie*. He considered the discussion to have confirmed his views as to the idiopathic nature of leukoplakia, and the frequent absence of syphilis as an initial cause.

Lymphadénie Cutanée.

Dr. Vidal, Paris.

L'affection dont j'ai l'honneur d'entretenir la section a été particulièrement étudiée en France. Malgré sa rareté j'ai eu l'occasion d'en voir six exemples dans mon service et deux dans les salles de mon savant collègue, le Dr. Hillairet.

C'est la maladie désignée par Alibert sous le nom de mycosis fongoïde, bien distinguée par Bazin, qui dès 1862, en avait parfaitement décrit les symptômes cliniques, et qui plus tard devait en tracer de main de maître la nosographie dans un travail auquel je puis renvoyer pour l'historique. (Art. Mycosis fongoïde, diathèse lymphadénique 1876.)

C'est le lymphôme ou lymphadenome de Virchow, produisant dans la peau une altération identique à celle de l'adénie de Trousseau (maladie de Hodgkin), identique à celle qui a été signalée dans les ganglions, dans les amygdales, dans la rate, le foie, les reins, les os, &c. Cette lésion est caractérisée par la production anormale d'un néoplasme adénoïde (tissu adénoïde de His) avec reticulum lymphatique, dont les mailles sont remplies de cellules embryonnaires et d'éléments

lymphatiques. Pour bien voir les mailles du reticulum lymphatique, il est n saire de brosser avec soin avec un pinceau. C'est ce mode de préparation, indiqué par notre illustre histologiste Ranvier, qui lui a permis en 1869 de re naître que le mycosis fongoïde est un lymphadenome de la peau.

M. Hillairet vous exposera les symptômes et la marche de cette affection, la terminaison est pour ainsi dire toujours mortelle. Je ne connais qu'un exe de guérison, à la suite d'une érysipèle, observé et publié par Bazin.

De tous les moyens que j'ai essayé comme traitement local, le seul qui i donné des résultats satisfaisants est la pommade avec vaseline 5, acide pyrogallic sous l'influence de cette pommade j'ai obtenu la résolution des tumeurs et l'a rence de guérison.

N.B.—La pièce de mycosis fongoïde de la jambe et du pied (Museum of I College of Surgeons), modelée sur un malade du service de M. Vidal (hôpita Louis) ne représente pas un mycosis fongoïde, mais bien un exemple de sarc multiples de la peau—dermato-sarcome généralisé (sarcome érectile).

M. Hillairet, Paris: Cette affection, confondue par Bontius et étudiée s nom d'affection fongoïde, a été classée par Alibert dans les dermatoses vérol Bazin en avait fait une diathèse sous le nom de diathèse fongoïde. Hardy l confondue avec le lichen hypertrophique.

Le début peut avoir lieu par un état eczématiforme chronique, ou un lichenoïde, puis se forment des tumeurs, les unes lisses, les autres mamelo comme une tomate, d'autres petites, pyriformes. Les tumeurs grossissent s'ulcèrent par un point; l'ulcération se fait très-rapidement. Elle peut envs glande mammaire qui devient d'une dureté presque cartilagineuse. D'autre les tumeurs se résolvent, s'affaissant avec une rapidité excessive; l'affection marcher vers la guérison, puis tout d'un coup les tumeurs reparaissent et rent; bientôt arrive la période cachectique—c'est alors seulement que l'on co la dérivation des globules rouges et l'augmentation quelquefois considérat globules blancs (leucocytes)—bien que quelques auteurs aient avancé q leucocytes se developpaient dès le début de la maladie, et en constituai caractère essentiel, ce qui les avait déterminé à les comprendre dans l'hist la leucocythémie. Mes recherches m'autorisent à dire que la leucæmie, dan affection est tout à fait secondaire et l'un des caractères de la période cache

La terminaison de cette affection se fait de différentes manières. Les ac hémorrhagiques sont les plus habituels.

DISCUSSION.

Prof. Kaposi, Vienna, believes that the disease described by Vidal and H may be the same which has been described by him under the name of *Sarco generalis* of the skin; by Geber as a special form of fungoid dermatitis of th by Duhring under the above-mentioned name.

Prof. Oscar Simon, Breslau, remarked that he had seen several cases disease, which he calls *granuloma multiplex*. Cases of it are described by Duhring, and others. The microscopic structure is the same as that which M has described. But as to the etiology, he found that nearly in all cases the were for years before, eczematous or psoriatic. He believes that the tum the result of malignant proliferation of connective tissue in chronic ec

psoriasis, in the same manner as epithelium can tend to malignant epithelial growth (epithelioma) in leucoplakia. He has treated the disease with ac. pyrogallicum $\frac{1}{15}$. He found that tumours disappeared, but came again. The disease is always malignant, and ends in death.

On Prurigo, or Eczematous Prurigo.

Mr. W. Morrant Baker, London.

In the present brief communication I am desirous of drawing attention to a disease of which I have seen many examples during the last few years, and which, as I gather also from conversation with others, is not very rare in this country.

The leading feature of the disease, as commonly seen, is eczema, wide-spread and most intractable. The face and upper part of the neck, the arms and forearms, the thighs and legs, usually their extensor surfaces, are the parts most affected; but the trunk does not escape, and the disease may be as bad here, in patches, as elsewhere.

The eczematous patches, as usually seen, are partly scabbed, partly raw, here and there pustular, especially at the margins; while their outlines are suggestive of the scratching to which they have been subjected. But, on looking more closely, it is obvious that the term eczema does not express all that is present. Between and around the patches of eczema the skin is more or less thickened and dry and, on passing the finger over it, it feels rough and sand-paper-like, or even prickly, but often it seems as if the rough papules were seated on a glazed and almost scar-like base. In some parts the skin is merely dry and a little scaly, as if xerodermatous; and, again, a large tract of skin may be healthy, especially on the flexor aspects of limbs.

The intense itching to which the patient is subject is represented by lines of scratched skin more or less marked, and the pruriginous aspect is heightened by the tiny blood-topped hard pimples which are scattered in the neighbourhood more or less profusely. Scattered pustules are also not rare, and the disease may bear a close resemblance to scabies.

The lymphatic glands corresponding with the diseased districts are enlarged; the femoral the most notably. Pigmentation has not been a very marked feature in more than a small proportion of the cases which I have seen.

The general health is not very much affected, but sometimes the patients are anæmic.

In all the cases which I have seen the disease is said to have begun in early infancy, and to have continued with merely remissions since that time. And in no case have I seen any other than temporary benefit as the result of treatment.

I have described thus briefly the characters of the disease for identification, but have avoided minute details, as my immediate object in bringing these cases before the Congress is that I may obtain an expression of opinion as to whether these cases are identical with those to which the late Professor Hebra more particularly applied the term Prurigo.

I had been long familiar with the disease before I had begun to associate it in my own mind with Prof. Hebra's prurigo; and I am indebted to Dr. Buchanan Baxter, with whom I saw one of the cases in consultation at the Evelina Hospital,

for the information that such cases had been called prurigo by dermatologists f the Continent who had seen them in England. I have since discovered that otl had come to a similar conclusion; and I may refer especially to Dr. Liveing, w in the last edition of his work on the diseases of the skin, calls attention to existence of cases of Hebra's prurigo in England, and to the causes which have to its being frequently overlooked.

Dr. Liveing remarks:—"The malady has hardly received the attention recognition that it merits from English observers. Some modern writers d altogether its existence in England. There can be little doubt that by many disease is not recognized from Hebra's description, and indeed this is scarcel be wondered at. . . . . There are several reasons why we often fail to find v I may call the typical eruption of prurigo. (1) The papules he describes (have not at all the appearance of vesicles) exist as such only for a very short t and they are quickly injured by the scratching of the patient; this fact, toge with the constant presence of excoriations, eczema, and other changes in the s makes it difficult to find them; (2) The large papules, though pale, are always of the same colour as the surrounding skin, but often of a distinctly re tint; (3) Hebra has, for the purpose of diagnosis, laid too much stress o elementary form of the eruption, and not enough, by comparison, on the histo the disease, which is, after all, a more important diagnostic feature."*

At the same time, I may quote the following remarks as a justification fo endeavour to elicit opinions on this subject:—Mr. Hutchinson, whose opinio any matter connected with diseases of the skin is entitled, as all will acknowl to the profoundest attention, has devoted a chapter, in his "Lectures on Cli Surgery," to the question, "Is Hebra's prurigo met with in English practice?" as all here are aware, he replies in the negative.

Dr. Duhring, in the last edition of his work on "Diseases of the Skin," marks:—"Prurigo, as described by German writers, is an affection so ra England and the United States as scarcely to exist in those countries."

Dr. Tilbury Fox, in the third edition of his work on "Diseases of the (1873), says:—"I have been on the look out for a case of the most marked fo disease, such as Hebra describes, for years past, and have only met wit case in England."

The question therefore arises, "Is the disease here referred to, and of w exhibited cases on Saturday last to the members of the Congress, the prur Professor Hebra?" If it be so, then we must give up the very generally ac belief that prurigo is rare in this country; although, to judge from Pr Hebra's description of typical cases, the disease would appear to exist amor in a far milder form, in most cases, than on the Continent. If, on the hand, the disease be distinct from Hebra's prurigo, we have before us, I ven think, a variety of prurigo to which the terms eczematous prurigo and pruri eczema seem about equally applicable, and which deserves a recognition has not yet been accorded to it. The symptoms appear to me to be quite d tive from those of any other disease. So far as I have been able to observ quite a different malady from infantile prurigo, or lichen urticatus, with one is tempted to find an alliance.

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* "A Handbook on Diseases of the Skin." By Robert Liveing, M.D. 1880. P

† "Diseases of the Skin." By Louis A. Duhring, M.D. 1881. P. 247, *not*

I believe it to be also distinct from the relapsing prurigo of Mr. Hutchinson; but regarding this I will not venture to speak with confidence, as I have not had an opportunity of seeing cases to which I am warranted in saying that Mr. Hutchinson would apply the term.

Instead of occupying the time of the Section by the narration of cases, I have exhibited living examples of the disease to which I venture to call attention.

DISCUSSION.

Prof. Kaposi, Vienna, stated that the three cases shown by Mr. Baker were undoubtedly true prurigo of Hebra, and therefore the disease exists in England. The reason of its being often overlooked was that too much stress was laid on the colour of the papules, and not enough on its total characters. Prof. Hebra attached much importance to its localization on the outer surface of the extremities, to its increase in severity from above downwards, so that the legs were most affected, and to its beginning during the first year of infancy. It does not commence as a papular eruption, but by urticaria, which becomes localized in the second year in the above-mentioned positions; papules now make their appearance, and the disease is established, but we are unable to say whether the case will be prurigo agria or prurigo mitis. Hebra's statement that the disease is incurable requires modification. Prurigo mitis, when treated from its earliest onset, and for some years continuously, is undoubtedly susceptible of complete or nearly complete cure.

Dr. Hebra, Vienna, had often wondered that prurigo was not diagnosed in England, as Willan was the first to describe the affection. He thought that was to be attributed to the fact that attention was directed only to the eczema, without taking into account its cause—excessive itching. Eczema is only *one* symptom of prurigo, and may be absent at the time of examination, especially if proper treatment has been previously carried out. Prurigo must be viewed as a sort of diathesis, which occurs chiefly in badly nourished individuals of the poorer classes, and in the children of tuberculous parents. The papules of the same colour as the skin, described by Willan and Hebra, have been lately considered to be due to scratching, and very recently Auspitz has viewed the pruritus and harshness of the skin as caused by a special congenital sensory neurosis. If we bear in mind the well-known features of prurigo, it will certainly be diagnosed as often in London as in Vienna. Dr. Hebra had already seen several undoubted cases at St. Bartholomew's Hospital. Treatment is only effectual when commenced in early infancy.

Mr. Malcolm Morris, London, pointed out that Mr. Baker had not mentioned the age to which the disease lasted. Mr. Hutchinson had denied that Hebra's prurigo existed in this country, because no case had been reported lasting beyond the age of twenty-one years, whereas Hebra's prurigo lasted for life.

Dr. Liveing, London, said he had met with cases lasting to thirty years of age.

Dr. Cavafy, London, had now one case under his care aged over thirty years.

Dr. Walter Smith, Dublin, had seen prurigo in a gentleman who is now over twenty-five. He had seen cases of prurigo unaccompanied by eczema.

The PRESIDENT observed that his diagnosis of the cases which had been brou under the notice of the section by his colleague, Mr. Morrant Baker, was on chronic eczema—an infantile eczema, which had continued to infest the skin fi a very early period of life. Eczema, like other diseases, presented several fact amongst which two of the most prominent were pruritus and exudation, and th two factors in some sort counterbalanced each other. Now, in the cases befor exudation had ceased, although infiltration was present, and precisely that stat the tissues remained in which pruritus was in excess. This state of the skin wo warrant such an appellation as pruriginous eczema, but not that of eczemat prurigo. Prurigo was essentially a neurotic affection, perfectly distinct in pathological nature from eczema; and it should be the effort of dermatologist keep them as separate as possible.

Dr. SANGSTER, London, would like to allude to the condition of xeroderma not by Mr. Baker. He had heard it said that ichthyotic patients were liable to freq attacks of eczema, and had verified this statement, not in ichthyosis, but in x dermia, which is its mildest form. He now had a patient under his care w skin was markedly xerodermic; she is now suffering from eczema, and has not l free from it for some years. Her skin is now thickened and pigmented, espec on the arms. She has a sister who is also affected with xeroderma.

Dr. L. DUNCAN BULKLEY, New York, thought that a certain confusion had made between prurigo and pruritus. He would be sorry to have the prurigo of H deprived of its characteristic features as described by Hebra himself, for he beli that the cases seen under this name in Vienna represented a peculiar and marked disease, quite different from those met with in other countries. The affe was certainly very rare in the United States, not more than two or three well-au ticated cases having been reported, although the disease was known to Ame dermatologists, who had learned to recognize it in Vienna. The speaker had not many cases elsewhere which he would be willing to call prurigo; many of thus called he would denominate papular eczema, while others were but prurit pruritus hiemalis. He was familiar with the affection spoken of as lichen catus, or, more properly, urticaria papulosa, and thought that these cases shou very carefully differentiated from prurigo.

Dr. UNNA, Hamburg, said that the description of prurigo vera given b Morrant Baker and Dr. Liveing completely agreed with the disease as seen b in Hamburg.

Prof. OSCAR SIMON, Breslau, did not agree with Dr. Bulkley that true pru only to be seen in Vienna; it is very common in Breslau and Berlin. The fe of the disease are those pointed out by Hebra, who, however, described not prurigo agria, but also prurigo mitis. He had some years' favourable expe of pilocarpine in the treatment of this disease; most of the cases eithe having relapsed, or only in a slight degree.

Dr. ALLAN JAMIESON, Edinburgh, asked, since the features of Hebra's pruri now undergone some alteration, as described by Prof. Kaposi and Dr. I

whether we might not proceed a step further, and believe that sometimes prurigo might commence late in life, and not invariably in infancy?

Prof. KAPOSI, Vienna, replied that in his experience prurigo never begins in later life. That which is seen in children before the age of two months is not true prurigo, but eczema, and is curable. It is sometimes called prurigo infantum.

Mr. MORRANT BAKER, London, replied that he was very glad there was a general agreement among the speakers that the cases which he had exhibited were really instances of Hebra's prurigo, although he regretted that the President of the Section took a somewhat different view of their nature. His reasons for believing that the disease was different from lichen urticatus of children were chiefly that he had seen complete and rapid recovery in cases of lichen urticatus, or infantile prurigo, when they were admitted into a hospital, and that the symptoms seemed essentially different when cases of true prurigo and of lichen urticatus of children were compared in patients of like age. He was not disposed to believe that the disease was due to a neurosis only, although the symptoms were doubtless much exaggerated by the secondary results of the irritation from which the patient suffered. Mr. Baker said he had seen cases of prurigo without eczema, such as those referred to by Dr. Walter Smith; and he had seen two cases of what he could term nothing else but prurigo, the first symptoms of which occurred in adult life; the patients were two sisters.

On a Case of the Occurrence of Dipterous Larvæ in the Human Skin.

Dr. WALTER G. SMITH, Dublin.

Some months ago my friend, Dr. Whittaker, of Valentia, co. Kerry, forwarded to me two specimens of a grub, preserved in glycerine, which he had extracted in the living state from the skin of a young girl under his observation. With the larvæ he was good enough to send an interesting account of the child's case, which I have his permission to publish.

Catherine C., twelve years of age, thin, pale, and delicate, was brought to Dr. Whittaker by her mother, on the 25th of November, 1880, with the following history. Two or three months previously, a swelling about the size of a pigeon's egg appeared on the outer ankle of the right foot, causing her some pain and uneasiness in walking. By degrees this tumour slowly moved up the leg and thigh, towards the body, and thence to the right axilla. From this it travelled to the right elbow, then back to the axilla, the right breast, and finally to the back of the neck on the right side. In this situation a small dark spot appeared in the centre of the tumour, which then subsided, leaving in its place a small welt. The dark spot developed into a small orifice, and the girl, upon pressing the welt, gave exit to a grub along with some semi-purulent matter. A few days afterwards a swelling similar to the first appeared a short distance from the place last named (back of the neck) and again disappeared leaving behind it a welt as before.

When Dr. Whittaker saw the girl, his attention was drawn to this peculiar welt, and to the finger it felt as if there were a piece of whipcord coiled under the skin in the subcutaneous cellular tissue. In the centre was a small orifice, and by pressing the little swelling between the finger and thumb a white grub, about one

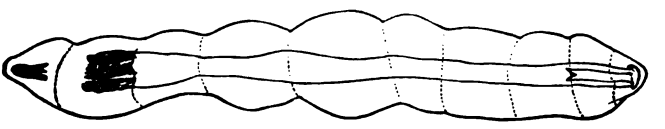
inch in length, annulated and alive, protruded through the opening, and esca along with a quantity of dirty-looking pus. The girl said that she expected tumour would next appear somewhere in the sternal region, as she could gener tell by an uncomfortable sensation or a feeling of soreness whereabouts it · likely to appear. On the 3rd of December she returned and informed the do that the swelling, as she had anticipated, did appear a day or two after her previ visit, over the lower part of the sternum, from whence it travelled to the r axilla, and thence to the inferior angle of the right scapula. Here it remained three days, and then slowly decreased, the usual welt and orifice remaining behi pressure upon the welt gave egress to another grub exactly similar to the specimen. The patient's mother could assign no cause for this curious phenome All the other members of the family are healthy, and the child enjoyed good he up to the time when the swelling first manifested itself, but since that she failed a good deal in her general condition and had lost flesh.

December 9th.—The child was brought back by her mother, who said that swelling appeared last night in the right side, moved up to the right axilla, and th down the right arm. Upon examination an undefined swelling was visible a back of the right arm above the elbow. This part had a brawny feel, was te to the touch, but exhibited no redness of the surface. The girl was kept u observation for some days, and Dr. Whittaker ascertained that the swelling ra migrated to the deltoid region, and in a few hours more removed to the neighl hood of the right acromion.

Dec. 11th.—The swelling seemed more superficial and had moved to th of the spine of the right scapula. At this juncture, unfortunately, the child le her own home, and on Dec. 22nd was brought back by her mother, who s that a few days after returning home, the right side of her daughter's hea face swelled and became discoloured, and the right eye was closed. Subsequ the peculiar tumour appeared on the right side of the forehead, ran the course, and yielded on expression a grub similar to the former specimens. this date the patient ceased her attendance, and nothing more was heard case. It may be noted as a curious fact that all throughout only the righ of the body was affected.

Remarks.—The authenticity of the above curious and rare case being question, the points of interest that suggest themselves are, how and when d eggs or grubs gain access to the patient's skin, and to what genus shoul larvæ be referred. Upon the first point I can throw no light. I submitt specimens (which I now exhibit) to some of my zoological friends, whc

Fig. 8.



Dipterous larva. Drawn with camera, under 2-inch objective,

unable to give me any definite information, beyond assigning the larvæ dipterous order of insects. The largest in my possession is 9 mm. in leng about 2 mm. in breadth.

A number of cases of the development of dipterous larvæ beneath the su the human body are reported in medical literature, but their zoological ide

tion is unfortunately shrouded in considerable obscurity. Humboldt gave the name of Œstrus humanus (*O. hominis*) to a parasite by no means rare in the south of America, and which is met with upon the arms, back, abdomen, and scrotum of man; but as Küchenmeister* points out, there is not sufficient justification for this nomenclature. Wagner† briefly states that Œstrus hominis lays its ova in the skin of man, giving rise to boils. In an interesting article on the so-called Œstrus hominis, Dr. S. Schreiber‡ maintains that all the cases of reported Œstrus larvæ in man in Europe have, on closer investigation, turned out to be larvæ of the genera Musca,§ Anthomyia, Lucilia, Sarcophaga, &c., especially whenever tested by breeding experiments. It is further very probable, or indeed certain, that when maggots have been found in man in boils under the skin, in the frontal or nasal cavities, wounds, &c., they only rarely correspond with larvæ of the four genera of the Œstrus family known in Europe (Œstrus, Hypoderma, Aphenomyia, and Cephalomyia), but have either forthwith been taken for Œstrus hominis or for larvæ of Hypoderma bovis.‖ All the hitherto certain and credible descriptions of larvæ found in boils beneath the skin of man, and actually proved to belong to Œstrus, emanate exclusively from the south and middle of America, where they are known as "ver macaque," "Torcel," &c. There is no Œstrus hominis proper to man only, as yet proven.

At a meeting of the Glasgow Pathological and Clinical Society Dr. John Young showed, for Dr. M'Calman, some larvæ removed from a girl who, on December 17, 1878, began to suffer from severe gnawing pain in the left elbow, attended with slight febrile disturbance. The elbow was swollen, and there was no history of injury. The swelling soon subsided under fomentations, and she felt quite well until January 17, 1879, when she experienced acute pain in the right forearm, with slight swelling. This also subsided, after extending to the upper arm, but on the twenty-third day a larva was noticed making its way through the skin, above the elbow, and was extracted by Dr. M'Calman. It had been preceded by a small vesicle, which the patient destroyed with her nail. Three days later a dusky blue tract was observed extending in a sinuous course from the middle of the forearm to the point of exit of the larva. The animal was an undoubted dipterous larva. (*British Medical Journal*, July 19, 1879; *Archives of Dermatology*, April, 1880, p. 174.)

Compare with the above the interesting case, reported by Dr. Fischer, of a peculiar squamo-vesicular skin disease, caused by the intrusion of a hymenopterous insect on the skin of an old lady. (*British Medical Journal*, March 20, 1880; from *Deutsche Med. Wochenschr.*, October 25, 1879.)

In Dr. Cobbold's work on Entozoa, a formidable list is given of insects and their larvæ which have been said to have taken up their residence in the human body, and I append a few references bearing upon the subject of my communication :—

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* "Manual of Parasites," Syd. Soc., 1857, p. 94.

† "General Pathology," p. 130.

‡ Virchow, *Archiv*, xxvi. (1863), p. 209.

§ A solitary larva of a species of Musca took up its residence in Dr. Livingstone's leg. Dr. Kirk removed the parasite by incision, and on a second occasion he obtained a similar specimen from the shoulder of a negro.—COBBOLD, "Entozoa," p. 420.

‖ Dr. J. M. Duncan has recorded a case of Œstrus bovis occurring in the human subject.—COBBOLD, "Entozoa."

Duncan, Dr. J. M., "On Bots:" *Edinburgh Veterinary Review*, i. 1858-59; *Monthly Journal of Medical Science*, July, 1854.
Spence, G. N., "On Œstrus:" *Edinburgh Medical Journal*, 1858; *Edinburgh Veterinary Review*, i. 1858–59.
Lessona, G., "On the Bot of the Horse:" *Recueil de Méd. Vét.; Veterinarian*, xxxvi. 1850.
Gamgee, J., "On Bots:" *Edinburgh Veterinary Review*, July, 1858.
Clark, "On Œstrus:" *Linn. Trans.*, iii. 1797.
Do., "On Bots:" An Essay. London, 1815.
Howship, "On Œstrus:" Medical and Chirurgical Society, 1832.

A Case of Supposed "Neurotic Excoriation."

Dr. Alfred Sangster, London.

The case about to be described was originally brought before the Clinical Society of London three years ago as one of abortive herpes.

The sequel, however, has led me to think that the eruption (if genuine) is one of a most rare class to which the name "Neurotic Excoriation" had already been applied by Mr. Erasmus Wilson.

Moreover, I thought the further history of the case of extreme interest and worthy of record. When first seen by me, the patient was a delicate-looking little girl, aged 13, very nervous, and shy in her behaviour. She presented herself at the Out-patient Department of Charing Cross, with a sharply margined patch of sero-purulent incrustation on the back of the left forearm; the patch was oval in shape, and measured 1½ inches in its long diameter. She at this time also showed two smaller livid and desquamating patches on the back of the left hand; these, she said, had presented a similar appearance to the patch before described. No diagnosis was made. In a few days she returned with a patch about the size of a half-crown on the forearm of the same side, but nearer to the elbow. The appearance of this lesion was so peculiar that some artificial mode of production was at once thought of. It was abruptly margined, and erythematous, hot, and painful to the touch, not raised, or exhibiting any readily appreciable inflammatory hardening or thickening of base.

Occupying almost the entire area of the patch was an unbroken and thin pellicle of dry, tawny-coloured epidermis, presenting a quite even appearance as to colour and surface. The patch looked as if it had been painted with some rather mild escharotic; the tawny brownish epidermis representing the part acted on by the chemical, the surrounding erythematous margin the halo of inflammation. It corresponded to no type of disease known to me. In a day or two the pain and heat subsided, the erythema disappeared from the margin, and there was left at the part a thin epidermic cake; soon this cracked, serum and sero-pus exuded through the cracks, and, drying on the surface, produced the heaped-up crusts before alluded to. Finally, in about ten days the crusts fell off, leaving the part livid and desquamating, but with no loss of substance. The rest is soon told. The girl has been under my observation off and on for a period of three years; during that time patches such as I have described, running a typical course of ten to fourteen days, have continued to make their appearance; three months is stated to be the longest

interval during which she has been free from them. Twice has she been in Charing Cross Hospital, carefully watched, and such means adopted as were permitted by her mother to establish the genuineness or artificial character of the eruption.

During the patient's stay in the Hospital the legs were bandaged, and the bandage secured by plaster, so as to prevent their being tampered with: notwithstanding, patches came out beneath the bandages, but so high up near the edge of the bandage that I could not say positively that the fingers or some instrument might not have been introduced beneath. Of one thing I was sure—namely, that the appearance of these lesions beneath the bandage negatived the theory of their production by painting on some chemical substance, as had been suggested.

I have examined *débris* from the patches microscopically, without result. From time to time I have noticed ecthymatous lesions between the patches such as never would arouse suspicion. On one occasion, when the case was seen by Dr. Liveing, such lesions were present.

Although the patches were most abundant on the extremities (often taking a ribbon-like form, and always in the long axis of the limb), my notes record others on the trunk, and even in positions such as the scapular region, hard to get at.

The patient was above twelve years old when I first saw her. At this time there was nothing marked in her behaviour. Soon, when she found out that she was suspected of fraud—for it was impossible to keep our suspicions from her—she became morose, surly in her replies, and answered with head averted. Her mother states that she is a very wayward and disobedient child.

She has an hysterical look. I have never seen her cry, nor have I ever been told (as I should have been) of fits or hysterical attacks. There was something said about her having had two fits when she first came under notice, but these were more of the character of "faints," certainly not of an hystero-epileptic nature.

At times there has been difficulty in making her take food, according to the mother's statement. She commenced to menstruate about eighteen months ago, and the periods are said to occur at fortnightly intervals.

She has grown rapidly, and is now well nourished, without any signs of cachexia.

She has never evinced any desire to show the patches; on the contrary, has only done so reluctantly.

She has taken iron, antimony, arsenic, valerianate of zinc, &c., without the least effect, *quoad* the eruption.

DISCUSSION.

The President observed that he should regard Mr. Sangster's case as thoroughly genuine, and free from any intentional participation on the part of the patient. It was a case of erythema somewhat like erythema nodosum in figure, with slight sanguineous effusion beneath the cuticle, which, adhering to the dried cuticle, gave rise to the peculiar appearance of the thin crust. This slight effusion of blood might, doubtless, be occasioned by the action of the nails; but the nails or friction could not produce such a lesion in the absence of a peculiar condition of the skin, and a peculiar state of the constitution of the patient, such as we are in the habit of denominating hysterical. An erythema circumscriptum, in an hysterical patient and with an exudative condition of the skin, would, he believed, explain all the symptoms of the case. This was not precisely the form of disease to which he had given the name of Neurotic excoriation, although it was undoubtedly allied

with it distantly. The neurotic excoriations were a form of prurigo associated with superficial vesication of the skin and an effusion of blood when rubbed or scratched. The neurosis produced both itching and superficial exudation; very slight pressure, or the action of the nails, did the rest—that is, broke the vesicated surface and occasioned the hæmorrhage. Then the neurotic excoriations were chronic, and crept along the skin, presenting at the growing end a semilunar border, and leaving behind a trail over which they had slowly crept. The points of interest in all these cases were:—The neurotic affection, sometimes indicated by severe itching; then that other well-known accompaniment of neurosis, effusion of serum or lymph, as in herpes; and, next of all, hæmorrhage. Thus we have formed a chain, of which one extremity is represented by simple prurigo, in the middle there may be herpes, and at the other extremity those hæmorrhagic excoriations which have been noted in Catholic countries and amongst religious women under the name of bleeding stigmata.

Dr. R. Liveing, London, had observed Dr. Sangster's case for a long time, and had come to the conclusion that the lesions were artificially produced, owing to the very great variety of eruptions shown, but there was also probably an extra-sensitive condition of the skin. Two years ago the case was certainly very like the neurotic excoriation of Wilson. He had lately seen two somewhat similar cases; in one the eruption was situated on the face and accompanied by marked hysteria—it was completely cured by valerian; the other was a case of hysteria with hæmatemesis, in which hæmorrhagic patches appeared on the face and on the arms. Hæmorrhage in this case was produced with the greatest ease by very slight suction of the skin, which was therefore probably in an abnormal condition.

Dr. Unna, Hamburg, said that the excoriation which he saw in Dr. Sangster's case impressed him as artificial, because it was bounded by sharply defined rectilinear margins.

Prof. Oscar Simon, Breslau, stated that Appenbrodt had described a very similar case as a vaso-motor neurosis, in which all possibility of artificial production was rigidly excluded.

Dr. Thin, London, believed that if the girl's hands were kept tied behind her back there would be an end of the eruption. He had seen the patient some months previously, and was shown an oblong erythematous patch on the thigh, with four lines of excoriation running parallel from one end of it to the other, produced, as he believed, by the girl's four finger nails.

Mr. Startin, London, had a similar case in a little child, in which the eruption appeared to follow the course of the superficial nerves of the abdomen and front of thigh. No doubt imposture might easily produce similar appearances; he had seen them follow the application of mustard.

Mr. Morrant Baker, London, said he agreed with the opinions generally expressed by others that Dr. Sangster's case was one of an eruption artificially produced. And he would lay especial stress upon the shape assumed by some of the patches upon the patient's arm, which had a quadrilateral outline—an outline which could scarcely be present in an eruption the result of real disease. He thought the

term neurotic excoriation would be allowable if it were taken to indicate that the neurotic element was essentially cerebro-spinal, and the excoriation the result of artificial irritation of the skin. Perhaps a better term still would be "neuro-mimetic"—a term which Sir James Paget had some years ago suggested as a good equivalent for what is commonly called hysterical.

Mr. GASKOIN, London, was acquainted with linear and quadrilateral forms of erythema which he did not consider artificial.

Dr. SANGSTER, London, in reply, was glad the President thought the case genuine. The case was probably partially hysterical, but mechanical irritation produced effects which would not occur on a healthy skin. The patient had often been carefully watched for a long time without fraud being detected. No lesions had ever appeared on the face.

Prof. KAPOSI, Vienna, suggested that it might be a case of urticaria bullosa with abortive bullæ.

A Critical and Historical Essay on the Sweat-Secretion.

Dr. UNNA, Hamburg.

Although the parts of the nervous system which are concerned in the production of sweat have been defined by recent physiological research, which has also shown the mutual independence of circulatory and sweat-phenomena, yet the old puzzle of "cold sweat" and "dry heat" are for each individual case still involved in obscurity. This failure on the part of a one-sided nerve-theory has led the author to undertake a criticism of the opinions hitherto held as the basis of the ordinary theories of the sweat-secretion. It has not been shown, either by physiology or pathology, that the sweat which exudes from the sweat pores comes exclusively from the sweat coils, nor does such a conception harmonize with the facts of comparative anatomy. No one has hitherto contested that there exists an unbroken histological series of gradations between the ordinary sweat glands and the glands surrounding the anus, in the axilla and the wax-glands of the ear, and that the latter continually, and the former intermittingly, pour out a secretion containing mucus, fat, or pigment. The watery element of the sweat, on the other hand, which no one has yet followed from the coil to the mouth of the duct, must in part be drawn from the blood-vessels of the papillary layer, perhaps also partly from those surrounding the duct, and from the rete mucosum, there being free communication between the inter-epithelial spaces of the prickle-cell layer and the lumen of the duct. The sweat is therefore a mixed fluid, derived from different sources, and its reaction varies according to its composition. Nerve-physiology has only shown that the sweat secretion is independent of blood pressure, and of the rapidity of the circulation, but not of the circulation as a whole, and the theory which holds that the sweat coil secretes watery sweat under continual nerve-stimulus must be rejected. The best theory is that derived from a vaso-motor and a musculo-motor hypothesis, which explains the action of the involuntary muscles connected with the gland, the remarkable transitions between fatty, mucoid, and pigmented sweat, and especially the phenomena of "cold sweat." The "dry heat," on the other hand, which is observed chiefly in general febrile states, and in certain skin diseases,

Sclerodermia Diffusa. (Sclérème des Adultes—Thirial.) Sclerema Adultorum.

Dr. J. Herbert Stowers, London.

The author related the history of a case of this disease which he had had under observation for a period of nearly six years, the patient herself having been previously exhibited to the members of the Section. The following is a brief abstract of the case:—Lydia ——, a married woman, with dark hair and complexion, was born in 1834 of healthy parents. She had three brothers and two sisters. One of the former died of phthisis at the age of 44 years, and one of the latter is now suffering from pulmonary consumption. For three months before his death, her brother was noticed to have an unnaturally hard and dry skin, while that of the two surviving is stated to be also unnaturally thickened. L. H. was fairly strong and well nourished until the period of her first pregnancy, at the age of 23 years. At that time she commenced to lose flesh, and complained of various subjective nervous symptoms, during the existence of which her right hand and fingers became swollen and stiff.

During the next five years the morbid process, still limited to the one hand, gradually developed, the skin over the phalangeal joints becoming inflamed with some discharge of pus from small ulcerations over the knuckles, and slowly contracting. By degrees the integument, at first tender and hypersensitive, became absolutely painful, sharp "flashes" of pain of a neuralgic kind starting from the finger points, frequently radiating over the hand, and passing up the forearm.

As months elapsed the integument over each articulation again swelled, and inflamed so much that the least movement was accompanied with acute suffering. The skin did not present excessive pigmentation, the colour remaining natural or of a reddish hue, the tightened and contracted state being observable at the extremities or pulps of the fingers previous to its extension to the joints, which followed during the five subsequent years.

As near as possible five years after the right hand became affected, the left commenced to undergo similar changes.

Besides the shortenings and contractions of the fingers from bone absorption, the author pointed out that all the joints, excepting the upper of each thumb (metacarpo-phalangeal), are quite fixed, and that the abnormal excessive pigmentation visible upon the dorsal surface of each had developed during the last twelve months. Skin changes of the same kind, though less intense, include the thighs and lower extremities.

In 1870 an altered and abnormal appearance of the integument of the face was first noticed.

Gradually from that date until the present the structural alterations have progressed, and now conspicuous among them are:—the angular outline of the face—the relative prominence of the malar bones; the shrinking and falling in of the cheeks; the retraction of the eyelids, producing considerable space between the globes and their coverings; the shrivelling and irregular contractions of the lips. Besides these, the whole of the integument is dense, hard, and unyielding; the surface is dotted here and there with numerous small capillary stases; and lastly, the existence, more particularly on each side of the forehead and towards the hair border, of marked excessive pigmentation.

characteristic lichen pilaris, and upon the arms the hairs were all surrounded by pointed epidermal accumulations, the same occurring to a very slight degree about the hairs of the scalp where they existed, although they were very scant and brittle. The disease in the hairs in this case appeared to be quite akin to the abnormal epidermic growth found in lichen pilaris.

Dr. THIN, London, in reply, remarked that he did not consider his case as similar to those which had been observed by Dr. Walter Smith and Dr. Liveing. Varicose hairs occur in various conditions, and would seem to imply intermitting energy in the growth of the hair. Their occurrence is not sufficient for the identification of a specific affection of the hair.

Selected Notes on Dermato-Therapeia, illustrating the Author's Views and Methods of Treatment of some Cutaneous Diseases.

Mr. ERASMUS WILSON, F.R.S., President.

A trustworthy remedy, like a trustworthy friend, is a possession most warmly to be cherished. Such a remedy we possess in the "Benzoated Oxide of Zinc Ointment." But it is not sufficient to possess a remedy; we must also know in what manner and when to make use of it.

The benzoated oxide of zinc ointment is a preparation of purified lard, through which the vapour of gum benjamin has been diffused in order to preserve it from rancidity; and, at the same time, this prepared lard is inspissated with oxide of zinc. In its nature this ointment is perfectly unirritating; it is easily spread on the skin, and when so spread it adheres closely and becomes a perfect shield to the skin, protecting it against the irritant action of the atmosphere. It assumes, in fact, the character of an artificial epidermis; it maintains an agreeable temperature and moisture of the skin; it preserves a state of tranquillity and comfort of the skin, favourable to the relief of irritability and itching, and equally favourable to the processes of healing. In a word, it is essentially a sedative remedy.

Let me illustrate the method of use of this valuable remedy by an example: in a severe case of eczema infantile, the skin is so much broken up and excoriated that the child may be said to be denuded of its epidermis. What can be more reasonable than to supply its place by a substituted skin? The oxide of zinc ointment fulfils this purpose admirably; but now our anxiety is to preserve our substituted skin unbroken and to maintain its supply as constantly as it may be rubbed off or dispersed. To effect these objects the skin must never be washed; and, whenever practicable, a covering should be applied to prevent the removal of the remedy. Mothers who have not yet tried the ointment will express their astonishment at being prohibited from washing or bathing their infants; and yet they are ready to acknowledge that the disease is always worse after ablution than it was before. The question which they put may be:—When shall I be permitted to wash my infant? To which the answer may be returned:—When the skin is sound enough to bear the washing without suffering. The question of cleanliness is very soon disposed of, for they speedily find that the ointment maintains the skin in a perfect state of nicety.

With the exception of eczema madidans and eczema amidst the hair, there is no form or stage of eczema in which the benzoated oxide of zinc ointment will not be found the very best remedy which could be employed. When crusts and scales have formed, both are softened and loosened by the ointment, and both may be removed by a gentle movement of the finger in the course of applying the remedy.

But I will take another case—a patch of dry eczema with more or less desquamation, such as we so frequently meet with on one or both legs. This is a patch which has been many months in existence, which has resisted every kind of torture with strong mercurial ointments and tar, which has been treated by envelopment, by the application of nitrate of silver, and blistered with a strong solution of caustic potash; but yet it yields not and persists most provokingly. It is a case which I should select as an illustration of a process of treatment which I have termed the sealing method. The process is very simple, but in general irresistible. I rub the zinc ointment into the whole of the inflamed surface gently but thoroughly; I use the remedy as if I were sealing up the skin, but the seal is nevertheless perfectly permeable from within, although impermeable from without; night and morning the inunction is to be repeated, and any impurities removed gently with a soft cloth. After the inunction I place a piece of fine chamois leather, large enough to cover the diseased patch, neatly and smoothly over the ointment; and then a binder should be applied, which should keep the dressing in its place without disturbance. Here then we have a process by which air and light are excluded; the morbid surface is, as it were, sealed up; external irritants are kept at a distance, and the weakened tissues are maintained in perfect tranquillity, and therefore in the best state to further the reparative processes. The dressing may not require to be disturbed more than once, or at most twice, in the twenty-four hours, and then the chamois leather covering is wiped and put back in its place. The cure in this case is quite certain, without pain or suffering, and more speedy than by any other process with which I am acquainted.

There are regions of the body where the healing process cannot be adopted, on account of inequality of surface or the movement of the part; but even in this instance it may be partially effected, as by means of a chamois-leather sleeve or gaiter, a slipper, a jacket, or a pair of drawers. The purposes to be aimed at are a perfect and continuous coating with ointment, the preservation of the coating so formed, and as much tranquillity and rest of the tissues as may thereby be attained. But when the protective dressings cannot be applied there, we must rely on the frequent repetition of the ointment, and the avoidance of such operations as are calculated to remove it.

It will, of course, be understood that, except in purely local cases, this topical treatment can only be regarded as ancillary to a well-intentioned constitutional treatment. Again, in eczema of the hairy scalp, the oxide of zinc ointment is prohibited on account of those very qualities which render it so valuable elsewhere —its tenacity, and tendency to cling to and accrete upon the skin. These qualities produce clogging and matting of the hair, whilst its whiteness is equally objectionable. But we are at no loss in this respect, for an ointment composed of one part of the nitric oxide of mercury ointment to three of petroleum ointment or vaseline, is as valuable a remedy on the scalp as is the benzoated oxide of zinc ointment on the rest of the body. There are parts of the skin likewise, and also stages of eczema, in which a lotion of lime-water, suspending the oxide of zinc and its congener, calamine (the latter for the sake of colour), would be found highly

deserving of favour. But even in the latter case the same intention is fulfilled—the formation of a protective layer, albeit of powder, over the inflamed surface.

The following gentlemen were appointed a Committee, to consider the question of nomenclature in reference to skin diseases, and to report at a future meeting of the Congress :—

Dr. Bulkley (Chairman), as representing America.
Dr. E. Vidal, as representing France.
Dr. R. Liveing, as representing England.
Dr. Kaposi, as representing Austria.
Dr. Oscar Simon, as representing Germany.

DISEASES OF THE THROAT.

Chairman.
Dr. George Johnson, F.R.S.

Secretaries.
Dr. De Havilland Hall.
Dr. Felix Semon.
Dr. Thomas J. Walker.

INAUGURAL ADDRESS,

BY THE CHAIRMAN,

Dr. GEORGE JOHNSON,
One of the Vice-Presidents of the Section of Medicine.

Gentlemen,—The first duty that I have to perform is to express my high appreciation of the honour conferred upon me in the appointment to preside over this important sub-section of medicine. I have next the pleasure to offer a hearty British welcome to the many very eminent laryngologists, who, from various parts of the Continents of Europe and America, have done us the favour and the honour to join this Congress, and to make, as they are about to do, numerous important and highly instructive communications to this department of medicine. The history of the laryngoscope has been often written, and is well known to this learned assembly. I am sure, however, that I shall have your sympathy and your approval in giving a brief expression of our indebtedness to Signor Garcia—whom we have the pleasure to welcome amongst us here to-day—for the important share which he has had in the invention of that instrument. While all previous attempts to inspect the living larynx have been incomplete and barren of further results, Signor Garcia, who has the unquestionable distinction of having been the first man whose thoughtful ingenuity enabled him to see his own larynx, published the results of his autoscopic observations in the "Proceedings of the Royal Society" (vol. vii. 1855), and this publication led on, through the appreciative mind of Professor Türck and the indefatigable zeal and exertions of the late lamented Professor Czermak, to the creation and the rapid development of the art of laryngoscopy.

It is scarcely possible to over-estimate the practical importance of this simple invention. I have been long enough in practice as a physician to have had ample experience of the enormous difficulties which often attended the diagnosis, and therefore the treatment, of diseases of the throat in the dark pre-laryngoscopic age. And now, by contrast, the result of the new light thrown upon this region by the throat mirror has been that within the last twenty years our knowledge of laryngeal diseases, including accuracy of diagnosis with certain and successful treatment, has made greater progress than that of any other department of medicine or surgery during the same period of time. In making this statement I am not unmindful of the immense advance which has been made in the diagnosis and treatment of eye diseases since the genius of Helmholtz conferred upon mankind the inestimable gift of the ophthalmoscope.

It is not without interest to compare the practical gains with regard to both diagnosis and treatment which have been derived respectively from the two analogous instruments—the ophthalmoscope and the laryngoscope. In regard to facility and accuracy of diagnosis, the ophthalmic surgeon and the laryngologist may be considered to have been about equally benefited by the use of their respective instruments. If we take into account the numerous remote diseases, more especially those of the nervous system, upon which the ophthalmoscope has thrown a new light, that instrument may perhaps be considered, in the matter of mere diagnosis, to take precedence of the laryngoscope. With regard, however, to improved methods of treatment, and in particular to the introduction of entirely new and previously impossible mechanical operations, there can, I think, be no question that the laryngoscope has done more than can fairly be claimed for the ophthalmoscope. Without doubt the exact diagnosis of eye diseases has led to improved and more successful treatment, but the ophthalmoscope has afforded no direct aid to treatment comparable, for example, with the safe and easy removal of morbid growths and foreign bodies which the laryngoscope has made an every-day proceeding.

Amongst the most interesting and important of the scientific and practical gains which have resulted from the use of these two instruments—and which may be claimed alike, if not equally for both—is the fact, that, by the inspection respectively of the interior of the eye and of the larynx, valuable light is often thrown upon the diseases of remote but physiologically correlated organs. If, for example, the ophthalmoscopist sees in the eye a retinitis significant of renal disease, a neuritis indicating cerebral tumour, or an embolism the result of valvular disease of the heart, so in like manner the laryngologist is often led by the observation of the paralytic or spasmodic condition of one or more laryngeal muscles to the diagnosis of a general neurotic condition to which the term hysteria is often applied, or of a special local disease in the nervous centre, or it may be of a tumour, cervical or intra-thoracic, pressing on the pneumogastric nerve or its branches.

It is obvious that all clinical facts of this kind, indicating as they do the interdependence and the close physiological relationship between various tissues and organs, are of great scientific and practical importance. There is reason for the belief that the more thorough and profound is the investigation of any disease or class of diseases, the more numerous and intimate will be found to be the relationship with other morbid states. The study of renal diseases affords abundant and most instructive illustrations of this proposition.

The more special, therefore, is any department of practice, the greater is the need to recur often to general principles, and to bear in mind that so close is the *solidarity* of the animal organism, that there is a literal and physiological truth in the apostolic statement: "If one member suffer, all the members suffer with it." The ill-informed public are apt to look upon a man who has a reputation for skill in the treatment of a particular class of diseases, as of necessity unacquainted with all other diseases. We, on the other hand, maintain that of the specialist it should be said with truth that he is one, not who knows less of disease in general, but who knows more of the particular class of diseases to which he has devoted most time and especial attention and study.

The Hippocratic maxim, "Life is short and Art is long," is as true now as it was two thousand years ago. Bearing this in mind, and knowing, as I do, how many valuable communications are in store for us, I will occupy no more of your time, but will at once call on the gentleman whose name stands first on the list to read his promised paper.

On the Invention of the Laryngoscope.

Signor MANUEL GARCIA, M.D. (*Honoris causa*), London.

To make a suitable reply to the flattering expressions addressed to me by our Chairman, and sanctioned by your approbation, would require a habit of speaking and an eloquence that I do not possess. *Parvus inter magnos*, I can but assure you how highly I appreciate the honour you have done me, and hope for your indulgent acceptance of my simple, sincere, and humble thanks.

In compliance with the desire which Dr. Semon was good enough to express in your name, I will tell you how the idea of the laryngoscope presented itself to me, and what were the results to which it led me. I fear, however, that this fragment of autobiography may prove a greater tax on your patience than you anticipate.

When I began to teach singing, the physiological explanations I was obliged to give to my pupils were purely empirical, and did not inspire me with any confidence as to results. At that time the vocal phenomena had been very imperfectly studied; thus, the number of registers, their extent, their individual characteristics, were not identical in the minds of all musicians. The *timbres* were often confounded with the registers; for no treatise of singing had yet appeared based upon anatomical and physiological considerations. In all cases instinct alone, sometimes happy, sometimes erroneous, was the only substitute for accurate knowledge.

Desirous of finding a more trustworthy guide, I began a course of anatomical and physiological studies, and the information thus acquired, added to the results of experience, were published in a method of singing; but some of the deepest and most interesting questions of physiology remained to me still unsolved.

I was especially anxious to find out what was the actual *rôle* played by the glottis in the production of the voice; but where to find the necessary information?

The authors who wrote on the voice took their ideas of what the action of the healthy, living glottis might be from glimpses they caught of it through wounds, or from experiments on dead bodies, or from vivisectional researches. As for the acoustic laws that govern the movements of the glottis, every writer on the subject explained them by analogies found in musical instruments of different kinds. Thus, the stringed instruments, the reed instruments, the appeau, &c., have all served as means of comparison.

These two systems, one of induction the other of comparison, though the only systems then possible, inevitably led to different theories on the part of different observers, and could not fail to keep the mind of the student in a state of perplexity. To dissipate my own doubts, I could think of but one method—it was, to see a healthy glottis exposed in the very act of singing; but how could the mysteries of an organ so well hidden be unveiled? One September day, in 1854, I was strolling in the Palais Royal, preoccupied with the ever-recurring wish so often repressed as unrealizable, when suddenly I saw the two mirrors of the laryngoscope in their respective positions, as if actually present before my eyes.

I went straight to Charrière, the surgical-instrument maker, and asking if he happened to possess a small mirror with a long handle, was informed that he had a little dentist's mirror, which had been one of the failures of the London Exhibition of 1851. I bought it for six francs. Having obtained also a hand

mirror, I returned home at once, very impatient to begin my experiments. I placed against the uvula the little mirror (which I had heated in warm water and carefully dried): then, flashing upon its surface with the hand mirror a ray of sunlight, I saw at once, to my great joy, the glottis wide open before me, and so fully exposed, that I could perceive a portion of the trachea.

When my excitement had somewhat subsided, I began to examine what was passing before my eyes. The manner in which the glottis silently opened and shut, and moved in the act of phonation, filled me with wonder.

From what I then witnessed, it was easy to conclude that the theory which attributed to the glottis alone the power of engendering sound was absolutely confirmed, from which it followed that the different positions taken by the larynx in front of the throat have no action whatever in the formation of sound; although, combined with divers elevations of the soft palate, they change the shape and the dimensions of the pharynx. In these changes we find the means of varying the qualities of the voice known as *timbres* or *Farbenklänge*.

I also perceived that vocal sounds are the results of explosions, not of communicated vibrations. This is proved by the fact that each separate lip of the glottis is incapable of producing any kind of sound. Besides, the lips do not protrude sufficiently to form vibrating reeds; and, if protruding, how could they vibrate in spite of recurring contact with each other?

Having thus seen the vocal organ in action, I next began to study the mechanism of the scale. This mechanism has two aspects—an exterior movement, visible with the mirrors; and an internal cause of that movement, which anatomy alone can explain. The exterior movement becomes manifest in the development of the scale.

Beginning from the lowest note, the glottis is put in motion throughout its whole length; but as the voice rises, the anterior apophyses are gradually pressed closer by a movement which spreads from back to front, and they are alternately in close contact. These continuous encroachments diminish the vibrating portion of the glottis until it becomes reduced to the ligaments alone.

The internal cause resides in the intrinsic muscles; and, among these, that which coats the outer surface of the crico-thyroid membrane—namely, the thyro-arytenoid muscle—was to me of the greatest interest. The fibres of which it is composed, although all starting from the anterior and lower cavity of the arytenoid cartilage, are not all of equal length. The most internal are the shortest. Each successive fibre becomes progressively longer and terminates in a more distant point of the ligament; the longest and most external only reaching the thyroid cartilage.

From this remarkable disposition, it follows that only the shortest fibres contract for the deepest notes, and, as the voice ascends, successive fibres come accumulatively into play.

To complete the subject, I ought to speak of the action of the other usic muscles; but that has been already treated in the pamphlet read at oyal Society in 1855. In the same paper I have also expressed my ideas formation of the registers.

ave spoken somewhat in detail of the thyro-arytenoid muscle, it is cial characteristics—the unequal length of its fibres and their inser- ligaments—have been disputed. But before venturing to represent result of my observations, I wished to make sure that I had not en; and, therefore, consulted Professor Thane, who, with a cordial r which I cannot sufficiently thank him, not only examined the point, but presented me to Mr. Shattock, begging him to assist me experience.

This is the drawing which that most skilful anatomist has been good enough to make for me. It entirely confirms the view which I have had the honour to place before you. I will not trouble you with further details.

The laryngoscope in itself is not an invention—it is a simple idea; and when I suggested to Dr. Mandl and to Dr. Segond that they should test its usefulness in the practice of healing, I was far from anticipating the brilliant future your science and skill reserved for it.

Local Treatment of Diphtheria.

Dr. Morell Mackenzie, London.

When I was honoured by an invitation to read a paper on the local treatment of diphtheria, I felt some hesitation in responding to the compliment, owing to the fact that I had little to add to the views which I had recently placed before the profession in connection with this important subject. Feeling, however, that the local treatment of diphtheria is a question on which there is not at present any general consensus of opinion, it appeared to me not unlikely that my paper might elicit valuable information from my confrères; whilst it would give me an opportunity of stating that further experience of antaërics, or varnishes, has yielded in my hands a far larger percentage of cures than any other local treatment. Under these circumstances two courses were open to me. One was to pass in brief review all the various remedies which have been extolled by practitioners; the other is to lay before you as concisely as possible the results of my own experience.

For practical purpcses the latter plan appeared preferable. But before carrying it out, it may be permissible to ask—How is it that such opposite modes of treatment have been enthusiastically recommended by different physicians?

Now, when a large number of remedies of different and even conflicting character are strongly recommended for the cure of a disease, it shows either that the malady is not infrequently of a mild and tractable nature, or else that some trifling disorder is liable to be mistaken for the more serious complaint. Both these conditions exist in connection with diphtheria, for the disease is often very slight and tends to spontaneous cure, whilst again it is closely simulated by some forms of follicular tonsillitis. These circumstances afford an ample explanation of the large series of cases that have been published from time to time in which recovery has taken place in every instance.

In dealing with the question committed to me—viz., "The local treatment of diphtheria"—I have considered that the title was meant to bear on the action of drugs used locally. Hence I have not considered the important operations of tracheotomy, or tubage of the trachea, or other surgical methods which may be often requisite.

Before proceeding to details, one more query may perhaps be allowed—viz., What is the object of local treatment? It appears to me to be threefold. 1st, To limit the further extension of the false membrane; 2ndly, To promote its separation; and 3rdly, To render its presence innocuous whilst it remains in contact with the tissues. These ends may be sought to be accomplished both by direct and indirect measures. Amongst the former agents may be mentioned those which retard or hasten the circulation, such as cold or heat; amongst the latter there are certain remedies which destroy, dissolve, and disinfect the false membrane.

Both cold and heat are useful under different conditions, and fortunately

these conditions can be easily laid down. For cold acts most beneficially in the early stage of the disease, and either produces no effect or acts injuriously later on; whilst heat is harmful at first, and only comes into useful operation when the complaint has become thoroughly established.

As a rule ice should be used both externally and internally—that is to say, it may be taken into the mouth and allowed to melt slowly, and it should be applied to the neck by means of a bladder or ice-bag. Sometimes, however, the external application of ice greatly alleviates, whilst its internal use is disagreeable or even hurtful. It is especially serviceable in the inflammatory type of the disease, but in nearly all cases, if used at the outbreak, it checks the vascular action on which the intensity of the affection so largely depends. As a rule cold acts better in the case of adults than in that of children, infants being seldom benefited by its employment.

Its use, however, is especially contra-indicated when suppuration has commenced, and it therefore seldom does good after the third or fourth day from the establishment of the morbid process. When the false membrane has begun to separate, cold is apt to check this curative process; and should there be any tendency to gangrene, the use of ice must be strictly forbidden.

Steam acts beneficially in most cases when the membrane has been formed for three or four days. It should never be used at a higher temperature than 120° Fahr. In the case of children who are too young to inhale, the croup-tent should be employed; but adults should use an inhaler every hour for ten or fifteen minutes at a time. The draught steam-kettle, which delivers a constant quantity of steam, answers extremely well both for adults and children, and saves the fatigue of inspiration. The use of steam is especially indicated when laryngeal diphtheria has become thoroughly developed—in a great measure only, however, because the comparatively inaccessible situation of the disease renders its treatment by other and more active remedies less feasible than when the false membrane is situated in the pharynx or nose. I am not, however, prepared to assign to hot vapour the high value which is accorded to it by Oertel, but consider it chiefly in the light of a valuable vehicle for conveying remedies to the diseased surface.

The real remedies we have to consider are the solvents, the disinfectants, and the antaërics. Caustics, once so largely used, are now happily seldom employed. Before proceeding to state my experience as to the value of different local remedies, I may remark that I have only noted the effects in those cases in which I have been able to direct the treatment throughout from near the commencement of the attack. It has often happened to me to be called in consultation to cases that were already doing well, and with these I have interfered as little as possible. Still more often it has been my lot to be summoned to patients at the point of death, and such cases have not appeared to be suitable for testing particular methods of treatment.

Amongst solvents, lime-water and lactic acid have proved the most serviceable in my hands. My experience of the action of lime-water is limited to the treatment of thirty-seven cases. Of these, twenty-three were severe, and fourteen mild; of the former, five died (17·3 per cent.), in three of the fatal cases the air-passages having been extensively involved. I have employed lactic acid in forty-five cases, of which thirty-six were severe and nine mild, the mortality amongst the former having been six (16·6 per cent.). In five of the fatal cases, the air-passages were involved.

In pharyngeal diphtheria these solvents can be applied either in the form of spray or as pigments. The former is the preferable method, but the latter may be found requisite in the case of young children and infants. Both in nasal and in laryngeal diphtheria I depend mainly on lactic acid. In the former affection,

from the commencement, I use a spray of lactic acid every two or three hours; and after the disease has existed for three or four days, I wash out the nasal passages daily, or on alternate days, with a douche, or collunarium, of carbolic acid (gr. ½ to gr. 2 ad oz.). Careful examinations, however, should be made from time to time, as it is better not to use the collunarium more often than it is absolutely required—that is to say, only when the false membrane is undergoing separation. In laryngeal diphtheria I likewise employ lactic acid sprays, and at the same time persevere in the use of steam, whilst it is needless to observe that tracheotomy remains as a resource which ought not to be too long postponed.

Several of my medical friends tell me that they have been disappointed in their trials of lactic acid; but on inquiry I have almost invariably found that the lactic acid has been too much diluted. The commercial acid varies greatly in strength, and I now use the preparation contained in the American Pharmacopœia,* which has a specific gravity of 1·212. Thirty minims of this acid in an ounce of water will form a solution of suitable strength. I have again to repeat here what I have already stated, that I have never seen any of the bad local effects of this agent described by Küchenmeister.†

Antiseptics may be used either for the purposes of destroying the germs of the disease, or for arresting the putrefactive process, or they may be employed with the view of effecting both these objects. If the remedy be used as a germ-destroyer, its administration should be commenced from the outset; but otherwise it may be deferred till changes begin to appear in the false membrane. For many years I have used both carbolic acid and permanganate of potash. The best mode of administering these remedies consists in the use of sprays. During the last three years I have also seen syrup of chloral hydrate employed locally in several cases with such great advantage that it has appeared to me to possess greater antiseptic properties in diphtheria than either carbolic acid or permanganate of potash. The chloral hydrate should be applied very freely with a brush every two hours until the false membrane ceases to reform.

Antaërics, or varnishes (*i.e.*, remedies which exclude the air from the false membrane), appear to me to be particularly valuable. I have now employed these remedies for three years and a half, and I never use any other local agent. I claim for this class of remedies that they fulfil the conditions which I laid down as being requisite. Here, perhaps, I may be permitted to remark incidentally that whilst I do not consider the bacterioid theory of the origin of diphtheria as *proved*, yet there is a vast amount of evidence as regards the conditions under which the diphtheritic poison flourishes, and as to the manner in which it is diffused, to show that its life-history is intimately connected with the evolution of germs. Be this, however, as it may, it is a well-known clinical fact that diphtheria can only develop on surfaces accessible to the air. It was this circumstance that led me to the idea that a remedy which could cut off the atmosphere from the diphtheritic membrane would prevent its further extension, and cause retrograde changes to take place in that already formed. I accordingly commenced a series of experiments in the year 1877, with a view of ascertaining which varnishes would dry most quickly, form the most impermeable coating, and at the same time cause no irritation of the throat. A long series of trials, in which benzoin, tolu, mastic, and resin were dissolved in rectified spirit, or in ether, and in which tinctures of the gums or resin were afterwards mixed with ether, convinced me that tolu dissolved in ether in the proportion of 1 to 5 was the best of these agents. In 1878 I commenced

* The German Pharmacopœia gives the specific gravity as 1·240, but I believe that any increase above the American standard is due to the presence of impurities.

† "Jahrbuch f. Kinderheilkunde," 1870.

Caustics were largely used in this country in the great epidemic which commenced in 1855; and during the years 1856, 1857, and 1858, I had many opportunities of witnessing the effects of strong nitrate of silver and hydrochloric acid. The results, however, were so uniformly unsatisfactory that I have never felt justified in applying them in the case of patients under my own care.

Astringents, especially tannic acid and alum, were used in a few cases in 1859; but when employed in mild strength they seemed to have no effect, and when strong, they certainly acted injuriously. Hence, I have never felt inclined to use these agents myself.

In conclusion, and for fear lest any practitioner should think that I trust too implicitly to local treatment, I must remind my audience that by the terms of the subject assigned to me, the value of constitutional remedies in diphtheria is excluded from consideration. Perhaps, however, I may be permitted to observe that I attach quite as much importance to suitable constitutional treatment, including medicine, food, and stimulants, as I do to the most skilfully selected topical agents.

Locale Behandlung der Diphtheritis.

Dr. Tobold, Berlin.

Dr. Tobold was not present; the members were referred to the following abstract of his views:—

Diphtherie unzweifelhaft eine durch ein specifisches Contagium erzeugte Allgemeinerkrankung, vergesellschaftet mit pseudomembranösen Entzündungen der oberen Luftwege. Nothwendigkeit den localen Processen besondre Aufmerksamkeit zuzuwenden, während selbstverständlich gegen die Allgemeinerkrankung der ganze Heilapparat in Anwendung gezogen wird.

Geschichtlicher Rückblick. Ehemals Zerstörung der Membranen mittelst aller denkbarer Caustica empfohlen. Unbefriedigende Erfahrungen. Später locale Application auflösender Mittel in Form von Gargarismen, Inhalationen, etc. Geringe Wirksamkeit des viel empfohlenen Kalkwassers. Energischer wirkt Milchsäure, ohne indessen die ihr zugeschriebene heilende Wirkung zu besitzen. Bestes gegenwärtig bekanntes Resolvens ist *feuchte Wärme* in Form von Dampf-Inhalationen mit Zusatz antiseptischer Mittel.

Schwefelblüthen und Adstringentia wenig nützlich.

Eis innerlich und äusserlich empfehlenswerth.

Schlussfolgerungen:

1.—Im Anfangstadium Eis innerlich, Isolation, Ventilation.

2.—Bei hoher Körpertemperatur nasskalte Einwickelungen des Körpers, Halses oder Halbbäder dringend nothwendig.

3.—Bei diphtheritischen Auflagerungen behufs Reinhaltung der oberen Luftwege locale Application resolvirender und desinficirender Mittel. Bei erwachsenen Kranken Gargarismen, warme Inhalationen; bei Kindern Einspritzungen mittelst Spritze. Bei geschickter Handhabung auch Application mittelst weichen, graden, fingerdicken Pinsels, der jedesmal sorgfältig zu reinigen und zu desinficiren ist.

4.—Anwendung der Caustica ebenso absolut zu verwerfen, wie

5.—Die mechanische Entfernung der Pseudo-Membranen.

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métique, en d'autres termes, que la culture de la diphthérie a besoin d'air, d'oxygène. Cette dernière conclusion est la conséquence d'une expérience dans laquelle l'affection inoculée n'a fait de grands progrès qu'après l'éloignement des sutures qui maintenaient l'œil clos." I have never seen the original article, and am indebted to Dr. Nicolas-Duranty, of Marseilles, for the above extract.

Local Treatment of Diphtheria.

Mr. Lennox Browne, London,

The first point in the local treatment of diphtheria is, naturally, how to detach the membrane with least irritation to the parts beneath it, and how to best prevent its re-appearance.

I am not of opinion that we yet have at our command any drug which actually, or even materially, dissolves the membrane; but, as the result of many repeated experiments, I arrive at the conclusion that lactic acid—not diluted to the high extent hitherto in use, but applied pure by the surgeon at least once or twice a day, and only moderately diluted (1 to 6 or 1 to 8), at frequent intervals, by the nurse—has some considerable influence in loosening molecular cohesion of the exudation, in a manner more favourable to separation than lime solutions, which, in my hands, have proved quite valueless. I am quite in accord with Drs. Tobold and Mackenzie, that caustics are harmful; and I agree with the latter that astringents are useless. Sprays, gargles, &c., are equally futile; but in cases in which the disease extends to the nose, frequent syringing of the wound with disinfectants, and direct application of the lactic acid, should be diligently pursued. Of disinfectants, I give preference to boracic acid, on account of its non-irritating qualities, even when used in saturated solution. I do not myself understand how it is possible to apply "varnishes" to the damp surface of the fauces with any hope of cohesion, nor how they can dry while moist air is constantly passing over the painted surface. Could these difficulties be overcome, I should still feel inclined to be sceptical of their therapeutical utility.

Coming to the best method of removing the membrane, or at least of applying the lactic acid solution, I of course agree that tearing away the exudation is as useless and injurious as would be similar treatment of the eruption of small-pox; but some degree of friction, with a soft instrument well charged with the solution, is a necessity of success in its application. For this purpose, in the case of children, I employ—and instruct the nurse also to use—the index finger, well swathed with lint, and soaked in the solution. For adults I substitute a firm cotton-wool brush, the wool being burned after use, and fresh substituted for each successive application.

Steam tents I have found very depressing, and do not employ them, even after tracheotomy, being content with application of a double layer of antiseptic gauze; and I have never seen good result from an excess of moisture in the inspired air. I have, however, had good results from the early employment of hot-air baths on both the general and local affection.

We are, I suppose, all agreed as to the value of ice as a grateful and efficient aid in reducing hyperæmia, and in favouring separation of the membrane. Seeing the difficulty of making children take it, I administer it in the form of frozen milk sweetened with sugar or sugar of milk, or of frozen beef tea. I recommend the same to adults, with the addition of the raw egg swallowed whole—four or six a day; and, with a view of giving functional rest, I advise no other food by the mouth, preferring, if necessary, to give further nutriment by enema. Almost the only medicine I employ has as much a local as a general effect—namely, chlorate of potash in barley water, flavoured with lemon. This should be sipped cold, and may be given almost *ad libitum*.

Beyond a calomel purge, with or without compound antimonial powder at the commencement of attack, I seldom give other drugs. I am convinced that iron is frequently not assimilated, at any rate in the large doses often prescribed.

Externally, poultices, ice-bags, &c., are cumbersome, wearisome, and, in my experience, unproductive of sufficient relief to compensate for their inconvenience. From recent experience in other inflammatory throat affections, I advise, with

great confidence, a trial of constant cold applications by means of Leiter's pliable temperature regulators, which are the perfection of simplicity and comfort.

All are aware how much more prone are those who suffer from enlarged tonsils to be affected by diphtheritic influences, and also to what a serious extent the existence of such a condition complicates matters and imperils the chances of recovery. One must have seen over and over again oral and nasal respiration each hour more impeded from this cause, and for the same reason found inspection of the larynx impossible. I therefore, some three years ago, in such a case removed the tonsils of a child suffering from diphtheria on the first occasion of seeing her. The result was an immediate improvement in the breathing; there was no extension of the disease to the larynx. The membrane was, of course, re-deposited, but it ultimately cleared. The child had several sequelæ of diphtheria, but finally made a very good recovery. I reported the case in detail at the Medical Society of London; and I have since had a similar case with an equally good result; and another in which I removed from an adult, aged 23, an enormously swollen and œdematous uvula during the acute diphtheritic state. I am quite prepared to hear the wisdom of this practice questioned; but, however startling the procedure may at first sight appear, I think the theoretical objections likely to be raised against it will vanish with practical experience. If one looks on diphtheritic exudation primarily as a local expression of a general blood poison, I cannot think that the fear of increasing the blood poisoning which has been advanced to me, is other than chimerical. I claim the following advantages for the procedure:—First, that it removes a mechanical impediment to respiration; secondly, that it probably prevents the downward progress of the exudation; and, thirdly, that when employed it would often render unnecessary the more dangerous measure of opening the windpipe at a later stage of the disease.

The question of tracheotomy hardly enters into consideration under the terms of the discussion. I would only mention that, for after removal of membrane from the trachea, I employ an adaptation of Siegel's pneumatic ear-syringe, with exhausting ball, for suction purposes; and that another admirable instrument for the purpose is the aspirator known as "Coudereau's." This has been slightly modified for me by Messrs. Krohne and Sesemann; so that by a very simple contrivance fresh air, or hyper-oxygenated air, can be introduced to the lungs almost instantaneously after extraction of the exudation.

DISCUSSION.

Dr. Meyer, Copenhagen: A countryman of mine, a rural practitioner, Dr. Nix, at Rude, Skjelskjör, Denmark, has desired me to bring forward his experience about a local treatment of diphtheria which he devised several years ago, and has used ever since in different epidemics. The treatment consists chiefly in scraping away the membranes and eventually the subjacent softened infiltrated parts by means of a scoop and cauterizing the scraped surfaces energetically with solid nitrate of silver. Before this cauterization the blood, never being very copious, is dried off with a sponge on a piece of whalebone, whilst, after cauterization, the superfluous caustic is washed away by injecting cold water. The membranes being regenerated rather quickly, the same treatment has to be repeated on the two subsequent days. On the following days the membranes usually appear slower and are smaller and thinner; so the treatment afterwards is repeated at greater intervals. The average number of scrapings amounts to six. Besides the scraping and cauterization gargles are used of weak carbolised water, or a half per cent. solution of quinine, and the throat is brushed several times a day with a sponge containing a two per cent. solution of nitrate

Dr. E. Fränkel, Hamburg: Want of success often follows the treatment by pilocarpine. This causes, it is true, detachment of the membranes, but produces no alteration in the gravity of the general symptoms. I consider, however, the latter to be the essential ones, the depositions only symptomatic, and I am consequently opposed to any direct interference with them, especially against their being scraped away. I would, on the contrary, advise energetic general treatment (stimulants from the beginning), and seeing that there is great want of proportion between the local deposits and the gravity of the general affection, to which the patients often succumb—parenchymatous myocarditis, diseases of the abdominal organs, &c.—whilst the local deposits are slight, I would only advise locally moist warmth.

Dr. Rothe, Altenburg: I agree with those who consider diphtheria a constitutional disease. But every practitioner knows that the local process is, as it were, the barometer by which we judge the progress of the disease and the degree of its severity. I have hardly ever seen a case with but slight local affection end fatally. My object, however, was to draw the attention to a remedy the *modus operandi* of which is based on the same principle apparently as that of the pilocarpine just mentioned by Dr. Fränkel. It is the cyanide of mercury. After having tried with negative result calomel, the free use of inunctions with blue ointment, &c., I recollected a short notice about the cyanide by Erichsen, in 1877, who treated twenty-five cases, of which he lost three. This is of itself nothing, for I had with the local treament with iodide of phenol no deaths in the first 150 cases at least, and dreamed of a "specific" until the deaths came. With the cyanide I treated in short succession from November till June, thirty-four cases, all of which recovered, although there were among them severe cases. I gave the remedy in the following formula:—R Hydrarg. cyanid. gr. $\frac{1}{6}$, aq. dest. ℥iv, tinct. aconiti, min. xx (to reduce the fever), a tablespoonful every hour, for children under ten years; hydrarg. cyanid. gr. $\frac{1}{6}$, aq. dest. ℥ij, tinct. acon. min. x, a teaspoonful every hour for patients above that age. The membranes when already formed (and I consider only those real cases of diphtheria), seemed in the course of one to three days to grow thinner and more transparent, until for several days only a fine film, like hoar frost, was left covering the parts; underneath this the mucous membrane soon came forth in a healthy appearance.

Dr. Prosser James, London: I believe that the influence of cyanide of mercury does not differ from that of other preparations of the same metal. Mercury was largely used by British practitioners a generation ago in the belief that it possessed the power of arresting the exudative process; it has, however, been almost, if not altogether, abandoned even in those cases of so-called sthenic croup, in which the exudation was chiefly, if not entirely, laryngeal. I still rely on the use of steam as originally recommended by me more than twenty years ago, and of late years I have combined this treatment with antiseptics and solvents. Of the latter I have found lactic acid most effectual. I cannot accept the conclusion that mechanical removal is absolutely contra-indicated. There are cases in which such removal of false membrane from the larynx can be accomplished, and in which tracheotomy may thereby be avoided. The removal of the tonsils or uvula during the progress of diphtheria is, I think, not unattended with risk; and therefore only to be recommended in exceptional cases.

Dr. Johnson, Chicago: I can testify to the utility of the fumes from slaking lime in certain cases, and consider that it is very difficult to come to a

positive agreement as to local treatment, bearing in mind the difference in the type of the disease under different circumstances.

Dr. Morell Mackenzie: Once more I would strongly advocate the use of varnishes. Disastrous results attended the forcible removal of the membrane, as recommended by Dr. Nix, in the hands of English medical men in the great epidemic of 1856-57.

La pathologie de la phthisie laryngée.

Professor Krishaber, Paris.

Si la phthisie laryngée est un des écueils les plus douloureux de la pratique médicale, elle est aussi l'une des maladies sur lesquelles on a beaucoup écrit et discuté: mémoires, articles de journaux, communications aux sociétés savantes, &c. semblent avoir tellement épuisé le sujet, qu'au moment de remplir la tâche que vous m'avez confiée, je pourrais craindre de tomber dans les banalités.

Le seul côté du sujet qui mérite d'être porté devant vous concerne le pronostic de la maladie, parcequ'il soulève incidemment la question encore litigieuse de l'anatomie pathologique; la gravité et la fréquence de la phthisie laryngée prêtent en effet un intérêt éminemment pratique au problème que je vais avoir l'honneur d'aborder ici.

Des observateurs de valeur égale ont émis des opinions diamétralement opposées sur l'anatomie pathologique de la phthisie laryngée, et comme la terminaison de la maladie est en corrélation intime avec la nature de la lésion, il me sera permis de traiter comme une seule question l'anatomie pathologique et le pronostic.

Nous sommes loin de l'époque où l'on confondait toutes les maladies graves du larynx sous la dénomination commune de phthisie laryngée. Déjà avant l'apparition du laryngoscope, on avait décrit sous ce nom la laryngite ulcéreuse des tuberculeux; on mit hors cadre les ulcérations diathésiques ou locales de toute autre nature. Cette délimitation essentielle n'est donc pas une conquête du laryngoscope; mais ce nouveau moyen d'investigation a soulevé la question importante de savoir si la laryngite est tuberculeuse en elle-même, ou, pour préciser davantage, si l'organe est envahi par le tubercule en nature, ou bien si le larynx s'ulcère simplement et subit des altérations de tissu en dehors de la présence de cette production morbide, ce qui constituerait la laryngite des tuberculeux, mais non la laryngite tuberculeuse.

La question, déjà nettement posée par Trousseau et Belloc, a été résolue, depuis, par d'éminents anatomo-pathologistes dans des sens opposés. D'un côté nous trouvons Louis, Andral, Cruveilhier, Monneret, Rheiner, Rühle, Rindfleisch; de l'autre, Rokitansky, Lhéritier, Virchow, Barth, Cornil et Hérard, Lambert et je passe un grand nombre de noms.

Cette divergence d'opinion tient surtout à ce que les uns ne veulent reconnaître comme tubercule que la matière caséeuse que l'on ne rencontre pas fréquemment dans le larynx, tandis que les autres rattachent l'ulcération à la présence des granulations et affirment que la laryngite ulcéreuse est due à une [illegible] même que les granulations n'existent plus et que [illegible] de leur passage.

[illegible] portance capitale a jeté une vive lumière sur la [illegible] des complications de la phthisie laryngée, la [illegible] de la langue, dont toute l'évolution est facile à

suivre et qui a pu être observée un bon nombre de fois. On a pu conclure que le tubercule se trouve *en nature* dans la muqueuse des voies supérieures.

Les partisans de la non-existence du tubercule dans le larynx invoquent en faveur de leur opinion les autopsies d'individus morts de phthisie pulmonaire compliquée d'ulcérations du larynx sans que la présence du tubercule sous sa forme granuleuse ou caséeuse ait été constatée : telle est l'origine de la dénomination de laryngite des tuberculeux, c'est-à-dire d'une inflammation ulcéreuse diathésique, mais non tuberculeuse *in loco*.

Personnellement, il ne me répugne pas d'admettre que la laryngite survenue chez un sujet tuberculeux puisse devenir ulcéreuse sans que le produit morbide ait existé sur place ; mais je me borne à faire observer que très souvent le tubercule existe dans le larynx, sous la forme granuleuse, quelquefois sous la forme caséeuse, et qu'il est aisé d'en verifier à l'autopsie les divers degrés d'évolution depuis l'infiltration jusqu'au ramollissement compliqué de vastes pertes de substance du tissu de l'organe.

Si la question est intéressante au point de vue purement anatomo-pathologique, elle prend une importance considérable quand il s'agit du pronostic et du traitement de la maladie.

Nous voici en face du redoutable problème de la curabilité de la phthisie laryngée.

Déjà l'année dernière il a été posé au congrès laryngologique de Milan, mais il n'y fut traité qu'incidemment.

Les opinions émises alors et soutenues depuis, tendraient à admettre comme assez fréquents les cas de guérison, relative ou absolue, de la phthisie laryngée.

Au congrès de Milan, une seule dissidence se produisit ; comme elle venait de ma part, je vous demande la permission d'exposer clairement une opinion que l'on a dans la suite quelque peu défigurée.

J'ai soutenu et je maintiens que les individus atteints de phthisie laryngée succombent invariablement au progrès de la tuberculose, soit que cette tuberculose si borne aux voies respiratoires, soit qu'elle s'étende sur d'autres organes de l'économie. L'ulcération tuberculeuse du larynx guérit quelquefois, mais fort rarement ; la cicatrisation partielle s'accomplit alors, pour ainsi dire, sous les yeux de l'observateur ; mais, circonstance très grave, l'ulcération se produit sur un autre point de l'organe, et alors même que cela n'a pas lieu, des complications rapprochées ou éloignées du larynx impriment à la situation le caractère désolant des maladies à marche fatale. Une érosion, une ulcération même, peuvent se cicatriser, mais le malade n'est pas guéri, car la maladie n'en poursuit pas moins son évolution avec une malignité extrême. Il importe peu, en réalité, de démontrer que chez des individus atteints de phthisie laryngée les ulcérations ont partiellement et temporairement disparu de la muqueuse de l'organe ; je ne nie point ces faits, ayant en personnellement l'occasion de les observer, mais ce que je n'ai jamais vu, c'est un individu atteint de phthisie laryngée récupérer la santé ; je déclare que les observations de guérison publiées jusqu'à ce jour n'ont pas modifié ma conviction.

La phthisie laryngée est une des manifestations les plus graves de la tuberculose qui, fort heureusement, n'est pas au même degré meurtrière lorsqu'elle atteint certains autres organes.

Il est singulier que le poumon qui, dans la hiérarchie organique, occupe un rang plus élevé que le larynx, puisse être atteint de tubercules sur une assez large étendue, sans que l'affection devienne irrémédiable. Les individus atteints de tubercules pulmonaires vivent parfois assez longtemps, tandis que les malades atteints de tubercules du larynx sont enlevés rapidement. La majorité meurt en moins d'un an ; quelques-uns résistent deux ans, mais je n'ai observé jusqu'ici que trois cas exceptionnels. Un de ces malades

n'a succombé qu'au bout de quatre ans, un autre, malade depuis quatre ans, vit encore, mais je prévois un dénouement prochain; chez le troisième, que j'observe depuis six ans, l'affection marche avec une telle lenteur que j'ai conçu quelques doutes sur la réalité du tubercule malgré les complications survenues au testicule et aux pavillons des trompes d'Eustache, et malgré l'existence depuis vingt ans d'une fistule à l'anus. Ce malade est à tous égards si extraordinaire, que son cas ne pourrait être invoqué ni pour, ni contre la thèse que je soutiens.

Dans une communication forcément écourtée comme celle-ci, on ne peut s'appesantir sur des faits isolés. J'apporte devant vous l'impression générale qui résulte pour moi d'une pratique déjà longue et d'observations extrêmement nombreuses; si cette impression n'est pas consolante, je crois du moins pouvoir affirmer qu'avouer notre impuissance et reconnaître la nécessité de recherches nouvelles, c'est mieux servir la science que de rendre, involontairement sans doute et avec la meilleure foi du monde, les faits complices de ses illusions.

Conclusions.—Les lésions de la phthisie laryngée dont la nature tuberculeuse a été pendant longtemps méconnue, relèvent de la tuberculose *in loco*, alors même qu'à l'autopsie la présence du tubercule dans le tissu du larynx ne peut plus être constatée. Il est des cas dûment avérés de tubercules en nature, soit sous forme d'infiltration diffuse, soit sous forme de granulations grises; le tubercule en masses caséeuses est au contraire beaucoup plus rare dans le larynx.

Il existe dans la muqueuse de cet organe des cavernules microscopiques suite du processus nécrobiotique dont le point de départ parait être l'altération des vaisseaux par des cellules embryonnaires. Ces éléments apparaissent d'abord sur la membrane interne du vaisseau, mais ils se groupent aussi autour de lui; ils finissent, en l'envahissant progressivement, par oblitérer le vaisseau.

La phthisie laryngée en dehors de la tuberculose du poumon a été signalée quelquefois, mais son existence est encore douteuse.

Les tubercules du pharynx et de la langue sont presque toujours accompagnés de lésions analogues dans le larynx.

Pendant la vie des malades la laryngite tuberculeuse se présente avec des caractères très nettement accusés. Depuis les simple érosions de l'epithelium jusqu'à la destruction profonde des tissus, avec ou sans formation de bourgeons charnus qui peuvent devenir polypiformes, tout l'ensemble des lésions offre une image frappante qui rend le diagnostic très aisé au laryngoscope. La confusion ne pourrait être permise momentanément qu'avec la laryngite syphilitique, alors que l'auscultation ne révèle pas de lésion pulmonaire; mais le traitement spécifique de la syphilis lève bientôt tous les doutes qui, du reste, en dehors même de ce critérium, ne peuvent pas persister longtemps.

Le pronostic de la laryngite tuberculeuse est des plus graves. Les érosions, les ulcérations même peuvent se cicatriser localement, mais les lésions se reproduisent, alors même que la cicatrisation paraît définitive, ce qui arrive très rarement; la cause générale qui a donné naissance aux lésions du larynx persiste, et la tuberculose évolue dans d'autres organes avec toute sa malignité.

Die Pathologie der Kehlkopfphthise.

Prof. Rossbach, Würzburg.

Die Halsschwindsucht ist eine von den am häufigsten den Laryngologen zur Beobachtung und Behandlung kommenden Halskrankheiten und ihn von um so grösserer Bedeutung, weil einerseits die oft auf das äusserste gequälten Kranken in den Specialisten ihre einzige Rettungsmöglichkeit noch erblicken und selbst in den hoffnungslosesten Fällen sich an

anklammern und sich nicht abweisen lassen wollen, und anderseits, weil in der That die allgemeine und die locale Therapie beginnt, dieser früher auch von den Specialisten für unbesser-und unheilbar gehaltenen Krankheit eine günstigere Prognose stellen zu lassen. Da aber über diese Erkrankung unter den Beobachtern noch viele controverse Meinungen bestehen, und noch viele Punkte in der That eine eingehendere Bearbeitung erheischen, so ist es mit Recht von den verdienstvollen Leitern der laryngologischen Subsection des Londoner internationalen medicinischen Congresses für nothwendig erachtet worden, diese streitigen Punkte im Gebiete der Halsschwindsucht zum Vortrage und zur Debatte zu bringen. Wegen der ausserordentlichen Schwierigkeit vieler Fragen halten die meisten der erfahrensten Beobachter mit Recht noch die schriftliche Mittheilung ihrer Standpunkte zurück. Im persönlichen Verkehr und in der mündlichen Mittheilung dagegen werden dieselben wohl weniger Grund zur Zurückhaltung finden und es mag daher der Boden des Congresses die Früchte rascher zur Reife bringen, als es ohne diesen möglich wäre. Ich habe desshalb auch mit wirklicher Freude den ehrenvollen Auftrag angenommen, über den gegenwärtigen Stand der ganzen Lehre zu referiren und werde suchen, mit möglichster Unparteilichkeit und Vollständigkeit meiner Aufgabe gerecht zu werden.

Zwar über eine der wichtigsten Fragen, nämlich die nach der Natur der Halsgeschwüre bei Laryngo- und Tracheophthise, ist gerade in neuerer Zeit, namentlich in Folge der eingehenden Arbeit Heinze's mit seinen massenhaften mikroskopischen Untersuchungen phthisischer Kehlkopfgeschwüre, eine Einigkeit dahin erzielt und bereits auch von den namhaftesten Laryngologen ausgesprochen worden, dass die grösste Mehrzahl der bei Lungen-und Halsschwindsucht angetroffenen Kehlkopf-und Luftröhrengeschwüre specifischer, d. h. tuberculöser Natur ist. Es wird nicht geläugnet, dass mehr oder weniger häufig auch nicht tuberculöse Halsgeschwüre im phthisischen Halse vorkommen; aber die Ausschliesslichkeit, mit der manche ältere Autoren, wie Louis, Rheiner u. A. auf der nicht tuberculösen Natur der phthisischen Halsgeschwüre beharrten, wird von keinem modernen Laryngologen oder pathologischen Anatomen mehr getheilt.

Die "nicht tuberculösen" phthisischen Halsgeschwüre hat man bald von der Corrosion der Schleimhaut durch den putriden Schleim, bald von dem Druck geschwellter Schleimhautparthien oder von der starken Reibung des Luftstroms bei den unaufhörlichen Hustenanfällen abgeleitet; in jüngster Zeit hat Schottelius die so häufig zwischen den Aryknorpeln sich bildenden, mit starker Gewebeschwellung verbundenen Geschwüre auf ganz einfache physiologische und mechanische Momente zurückzuführen vermocht. So viel scheint man jetzt schon sagen zu können, dass die "nicht tuberculösen" phthisischen Halsgeschwüre von den verschiedensten Ursachen und nicht von einer einzigen der eben genannten hervorgerufen werden können; dass es "nicht tuberculöse" phthisische Geschwüre gibt bei Menschen, die einen einfachen katarrhalischen, wie bei solchen, die einen putriden oder auch gar keinen Auswurf haben, bei Menschen, welche nicht husten nnd welche von quälendem Husten unaufhörlich befallen sind; und ferner, dass ganz Lungensüchtige mit und ohne Husten, mit katarrhalischem oder putridem Auswurf u. s. w. vorkommen, die nie Halsgeschwüre bekommen, sondern bei ganz gesund bleibendem Halse an ihrer Lungenerkrankung zu Grunde gehen.

Während für die tuberculöse Halsschwindsucht von den meisten neueren Forschern als Ursache ein specifisches infectiöses Gift angenommen wird, welches von Aussen kommend oder auch im eigenen Körper, z. B. in vereiternden Drüsen selbst sich bildend meistentheils zuerst die Lungen befällt und von da auf den Blut- und Lymphbahnen zur Kehlkopfschleimhaut

fortgeführt wird, fand Schottelius bei einer grossen Zahl von Versuchen, dass nicht blos durch Einathmung von zerstäubtem phthisischem Auswurf, sondern auch von rein bronchitischem Schleim, ja selbst durch Einathmung von fein zerriebenem Kalbshirn oder Käse tuberkelgleiche Knötchen in der Lunge sich bilden und glaubt daher den Schluss ziehen zu dürfen, dass die Tuberkel auch der Halsorgane durch ganz verschiedene Ursachen und nicht blos durch ein einziges specifisches tuberculöses Gift hervorgerufen werden könnten.

Von primärer tuberculöser und nicht tuberculöser Halsschwindsucht sind zwar einzelne Fälle mitgetheilt; dieselben haben aber noch keine allgemeine Anerkennung gefunden, weil eine mögliche Täuschung und ein Uebersehen eines bereits vorhandenen Lungenleidens nicht auszuschliessen war. Jedoch scheint die Möglichkeit des Vorkommens einer primären Halsschwindsucht nicht absolut verneint, sondern nur als höchst selten bezeichnet werden zu dürfen. Es ist nicht nur denkbar, dass auch aus nicht specifischen Kehlkopfgeschwüren durch Einfliessen und Aspiriren des Eiters in die Lungen eine phthisische Erkrankung dieser eintritt, wie, dass auch primär einfach katarrhalische Halsgeschwüre im Laufe der weiteren Krankheitsentwicklung tuberculös werden; sondern es ist bereits von Sommerbrodt an Kaninchen experimentell durch künstlich hervorgerufene und unterhaltene Kehlkopfwunden und- Geschwüre eine Peribronchitis purulenta hervorgerufen worden, von welch' letzterer wir durch andere Beobachter wissen, dass ihre letzten Consequenzen die Zerstörung des Lungengewebes, die Lungenschwindsucht, zu sein pflegt.

Wie bei der Lungenschwindsucht ist auch bei der Halsschwindsucht zur Erklärung aller Beobachtungen nöthig, anzunehmen, dass es Individuen und Thierarten gibt, welche besonders zu diesen Erkrankungen disponirt sind, und andere, welche eine gewisse Immunität dagegen besitzen.

Laryngoskopisch ist es bis jetzt noch nicht gelungen, Tuberkelablagerung Tuberkelknötchen im Kehlkopf als solche zu erkennen, weder vor noch während der Ulcerationsperiode. Eine sichere Diagnose auf Halsschwindsucht kann man nur bei gleichzeitig nachweisbarer Lungenschwindsucht stellen. Ist ein phthisische Lungenaffection noch nicht nachweisbar und fehlen auch allgemein Zeichen von Syphilis, dann ist es nur möglich, tuberculöse und phthisisch Geschwüre durch ihr verschiedenes Verhalten gegen Iodnatrium von einande zu unterscheiden. Jedoch werden alle erfahrenen Laryngologen darin übereir stimmen, dass, oft lange bevor die physicalische Untersuchung der Lungen ei bestimmtes Ergebniss hat, das Auftreten hartnäckiger und den gewöhnliche Heilmethoden trotzender Halsgeschwüre auf ein drohendes oder versteckt Lungenleiden mit Sicherheit hinweist.

Halsschwindsucht ist ein ausserordentlich hartnäckiges Leiden, doch nur sehr vorgerückten Stadien unheilbar. Im Beginne und selbst schon b ziemlich ausgebreiteten Zerstörungen hat man durch klimatotherapeutisc Maassnahmen und Einathmung antiseptischer Substanzen entschiedene Heilung beobachtet. Auch in den schwersten unheilbaren Formen ist es wenigste möglich, durch Aethereinstäubung auf den n. laryngeus superior, dur Morphin, Einschnitte in das ödematöse Gewebe Schmerzlosigkeit herzustell und das Schlucken wieder möglich zu machen.

DISCUSSION.

Dr. George Johnson, London: Pulmonary tuberculosis may possibly arise some cases from a simple laryngitis, either through absorption of morbid materi through the lymphatics, or through purulent secretions being carried into t bronchi and air cells by the inspiratory current of air.

Dr. B. Fränkel, Berlin: I wish to speak on two questions. 1st. Is it possi

to diagnosticate tuberculosis from the laryngoscopic image? In this respect laryngoscopy must take the lead, and must not admit of diagnosticating phthisis only from the complications. For laryngoscopy works with the highest of our senses—the eye; and in the overwhelming majority of cases the diagnosis can be made during life quite as certainly from the laryngoscopic image as microscopically after death on the dead body. This is true as well with regard to miliary tubercles as to the ulcers originating from them (simple, confluent, eroding). I do not deny that there are doubtful cases, but in a very large number of cases the diagnosis "miliary tubercle" and "tubercular ulcer" can be made during life quite positively. As to the doubtful cases, occasionally also laryngeal phthisis can heal under the use of iodide of potassium. It is not to be forgotten, however, that large doses of the iodides favour hæmoptysis. 2nd. As regards the question whether there is a primary laryngeal phthisis, I have seen primary laryngeal phthisis—*i.e.*, cases in which there was tuberculosis of the larynx, without the most careful examination showing anything morbid in other organs. It is true that in such cases, without exception, later on pulmonary phthisis supervenes; the post-mortem examination in these cases, however, shows that the larynx is the organ most attacked. The pulmonary trouble in these cases originates from aspiration, as proven in cases of carcinoma by Schech. It is necessary to take the clinical point of view in this respect, for pathological anatomy will always show coincidence of the disease in both organs.

Prof. SCHNITZLER, Vienna: I do not agree with Professor Rossbach's dictum—"It is impossible to recognize laryngoscopically the deposition of tubercles in the larynx before or during the period of ulceration." I have repeatedly observed for years past miliary laryngeal tuberculosis which I could laryngoscopically diagnosticate with absolute certainty. Quite recently a microscopic examination made on a specimen removed from a living person has corroborated my diagnosis (*Wiener Med. Presse*, 1881). My experience leads me to believe in the curability of the disease. I do not think it is possible to say positively whether there is a primary laryngeal phthisis, but it is undoubted that in many cases tuberculosis can be already diagnosticated in the larynx whilst no pathological change can be demonstrated in the lungs.

Prof. VOLTOLINI, Breslau: I doubt very much the occurrence of a primary laryngeal phthisis. We see every day countless cases of pulmonary phthisis die without the association of the same disease in the larynx, but I have not seen a single case of laryngeal phthisis die without concomitant pulmonary affection.

Prof. CADIER, Paris: With Professor Krishaber I recognize the gravity of laryngeal phthisis, but I do not admit that a cure cannot be obtained; at any rate, if not a definite cure, an improvement of considerable duration might be achieved, by associating an energetic local treatment to the general one. I have seen this year four patients who had been under my care and that of my late teacher, Professor Isambert, in 1873–74, and who had shown at that time unmistakable signs of laryngeal and pulmonary phthisis. When re-examined now they presented traces of the former laryngeal disorder, but no ulceration, whilst the arytenoid cartilages remained a little swollen; the state of the lungs had also a little improved, so that one could speak of a decided amelioration since 1873. The treatment employed consisted in the local application, made twice a week, of the following solution: creosote 1, alcohol 20, and glycerine 30 parts, in addition to an appropriate general treatment.

Dr. E. FRÄNKEL, Hamburg: I would make the historical remark that

Reinher had already positively demonstrated, in the fifth volume of Virchow's *Archives*, the origin of ulcers in the larynx from tubercles. The great majority of ulcers found in the larynx of a phthisical patient originate, no doubt, from circumscribed or diffused infiltrations, or from disease of the numerous mucous glands of the mucosa. I think that it is impossible to decide whether a primary laryngeal tuberculosis exists, inasmuch as even the absence of changes in the lungs does not give a proof of a real immunity of these organs. On the other hand, I do not doubt that tubercular laryngeal ulcers can heal. Clinical observation, as well as the anatomical evidence of cicatrices in the larynx, speak in favour of this possibility.

Professor GERHARDT, Würzburg: I advocate the theory of a mechanical and infectious origin of laryngeal phthisis, in the sense that frequently ulcers which were originally simple—*i.e.*, produced by attrition, &c., could become, if occurring in a phthisical patient, foci of infection and metamorphosed into tubercular ulcers. Differential diagnosis from luetic ulcers is often difficult, a transformation of typhoid ulcers into tubercular ones also occurs. A primary tuberculosis of the larynx seems probable in some cases. Laryngeal phthisis cannot any longer be regarded as incurable. Pulmonary phthisis having taken a more favourable position as regards treatment, the therapeutics of tubercular ulcerations of the larynx now ought to become the subject of the most strenuous and methodical curative efforts.

Professor KRISHABER, Paris: The thesis which I maintained last year at th Laryngological Congress at Milan, and which I again defend to-day, is no based upon a mere theoretical view. I have drawn up rigorously prepare statistics; I have followed it for many years, and I have brought forward to day its results. I have employed against laryngeal phthisis all known topica remedies—nitrate of silver, sulphate of zinc, sulphate of copper, iodine, chromi acid, acetic acid, the galvano-cautery, scarifications; and all these remedies hav remained absolutely inefficacious. I have finally adopted the method whic consists in making local applications of a narcotic solution for the sole purpo of relieving suffering; this is all that I have been able to obtain up to th present day. I will not say that tubercular laryngitis is incurable; I maintai only that the local therapeutic means in use are without action, and they a rather damaging than useful; we require something else and something bette

Professor ROSSBACH, Würzburg: In opposition to Professor Krishaber, I beg say that one positive case is more decisive than a thousand negative ones, and th for me the cure of laryngeal phthisis in several cases was so positively esta lished that no doubts of other observers are capable of shaking my convictio

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Die laryngoscopisch wahrnehmbaren Veränderungen in Fol von Erkrankung oder Verletzung der motorischen Ke kopfnerven.

Professor GERHARDT, Würzburg.

Zerstörung des Accessorius-Ursprungs oder des Vagusstammes am Ha bewirkt regungslose Cadaverstellung des Stimmbandes.

Zerstörung des oberen Kehlkopfnerven oder seines äusseren Astes geringe Aenderungen in Form und Bewegung des Stimmbandes zur Folge, nicht ganz übereinstimmend geschildert werden. Sie beziehen sich auf

Phonationsact, und zwar vorzugsweise auf Form, Höhenstand und sichtbare Schwingungen des Stimmbandrandes, ferner Verhinderung der activen Senkung des Kehldeckels—abhängig von Lähmung der Mm. crico-thyreoidei, ary- und thyreo-epiglottici.

Zerstörung des unteren Kehlkopfnerven versetzt das Stimmband in Cadaverstellung. Durch Thierexperimente ist es erwiesen, dass Durchschneidung des oberen nach dem unteren Kehlkopfnerven die Form der Glottis noch weiter ändert. Am Menschen ist der Unterschied zwischen Vagus- und Recurrens-Lähmung, d. h. der Einfluss, den nach Lähmung aller andern Stimmbandmuskeln der Cricothyreoideus noch auszuüben vermag, noch festzustellen. Langsam wirkender Druck auf die unteren Kehlkopfnerven lähmt zuerst die Erweiterer. Ausschliessliche Lähmung des Cricoarytaenoideus posticus bedingt hochgradige Adductionsstellung des Stimmbandes, noch vollständigere Adductionsbewegung bei der Inspiration, normale Phonationsschwingungen des Stimmbandes.

Es ist einiger Grund vorhanden zu der Annahme, dass auch die Absonderungsvorgänge der Kehlkopfschleimhaut von den Kehlkopfsnerven beeinflusst werden.

Laryngoscopic Signs in connection with Injuries or Diseases of the Motor Nerves of the Larynx.

Prof. G. M. Lefferts, New York.

That the entire subject of the motor neuroses of the larynx, as it to-day stands and in the light of our present knowledge concerning it, admits of a rearrangement and of more simplification, will not, I think, be denied; that a better classification is needed, not only for our present purposes of clear and pointed discussion, but likewise in view of the needs of the present and future student of laryngeal pathology, is evident; that it can be made, I believe.

Why should we still adhere as closely as of old to the arrangement of all laryngeal neuroses, purely upon the basis of the physiological and anatomical nature and character of the nervous supply of the larynx, or to that adapted to the arrangement of its muscular apparatus? Why commingle purely neuropathic cases with those of undoubted myopathic origin, and lose sight in the hazy atmosphere of doubt and uncertain statement of the sharp line of distinction that can be proven to exist between them? The answer would be a difficult one, but that the question of the motor neuroses of the larynx is complicated to an unnecessary degree, my researches in literature, my studies of text-books, and my experience as a teacher, do not allow me to doubt.

If you agree with me that this statement is true, our first efforts should be to place the whole matter upon a new, good, substantial, and—with due allowance for future amendment in questions concerning pathology—permanent foundation; and in pursuance of this purpose I submit the following new classification for your consideration.

I divide all motor neuroses of the larynx into five great classes. They are:—

(1) Motor paralyses of the larynx, the result of complete, usually acute, morbid implication of the nerve centres, or of the main nerve trunks, the lesion being either unilateral or bilateral, and the vocal cord or cords assuming the "cadaveric" position.

(2) Motor paralyses of the larynx, the result of incomplete, usually slowly progressive lesion of either the nerve centres or, more commonly, of the nerve trunks in their course; certain nuclei of the former or certain fibrils of the latter alone being implicated, certain muscles alone are paralysed. The

abductor muscles of the glottis possessing a peculiar proclivity in this respect, and practically being the only ones thus affected, the lesion may be unilateral or bilateral.

(3) Motor paralyses of individual muscles of the larynx, the result of implication of certain peripheral nerve twigs by local or intra-laryngeal lesion.

(4) Motor paralyses of single or groups of laryngeal muscles, the result of simple myopathic change in said muscles of a degenerative character.

(5) Motor paralyses functional in their nature, the adductor muscles being the ones commonly affected, the abductors very rarely.

Upon the first class of cases, if I now occupy a few moments in considering each in some detail, it is not necessary that I should dwell. Acute, complete, recurrent paralysis, be it unilateral or rarely bilateral, whether it have its origin in organic disease of the brain, at, or in the neighbourhood of, the floor of the fourth ventricle, or be due to complete degenerative lesion from pressure or disease of either the pneumogastric or spinal accessory nerves, in their course through chest or neck, as well as of like lesions of the recurrent branches of the former, or morbid implication of the anastomotic connections of the latter—constitute a division of my subject upon which there exists little or no difference of opinion, either as regards causation or ultimate laryngeal effects. The clinical facts have been repeatedly demonstrated and surely proven upon a purely physical basis. Aside from acute causes, such as traumatic influences or the rare occurrence of hæmorrhage or purulent extravasation into the floor o the fourth ventricle, as well as acute poisonous influences—locomotor ataxy with final participation of the medulla oblongata, progressive bulbar paralysis multiple sclerosis, play their progressive disease-producing *rôle;* cerebra syphilis and malignant tumour exert their baleful influence; apoplexy o softening occurs, tumours and aneurism within the skull press upon the spina accessory nerve, and in either may lie the source of the ultimately complet paralysis of all of the muscles of one or both vocal cords. The commone causes are even more familiar to us—the implication of the main nerve trunk of the pneumogastric or recurrent nerves in their course by aneurism of th carotids, of the arch of the aorta, or of the right subclavian; by the pressu of bronchocele, of enlarged cervical or bronchial glands, or tumours of the sam regions, be this external cause or internal retrogressive metamorphos unilateral or more rarely bilateral. Finally, the ravages of cancer of the œs phagus, pleuritic adhesions at the apex of the right lung, and pericardial exudatio all give rise—if not immediately, certainly within a limited time, if the lesion l progressive—to certain ultimate physical results, which, pictured in the larynge mirror, cannot be mistaken nor misinterpreted. The motionless vocal cord, motio less except for slight spasmodic movement imparted to it by the only partial paralysed arytænoideus proprius muscle, fixed in the "cadaveric" positio bespeaks at once to the practical eye both cause and result. The lesion is chara teristic; the diagnosis easy and conclusive; and the class of case which it plainly typifies may be set aside in our discussions with the verdict of prov To one point alone do I here call your attention. Pressure on one pneum gastric or recurrent nerve has been known in more than one instance to accompanied by paralysis, not only on the side on which the side was implicat but also on the opposite side of the larynx, the abductor muscles being t ones affected. Will the theory of a reflex paralysis, the different fibres of t nerve carrying the irritation back to the nuclei of the spinal accessory, suff to account for the phenomena? Do you accept Lockhart Clarke's dem stration of the decussation of the nuclei of the spinal accessory nerve, wh would theoretically explain the condition; or do you hold to the more tena theory that, in the reported instances, the nuclei of the spinal accessory m

have been diseased? A case of my own, elsewhere reported, certainly does not bear out this latter view. I submit the question for your consideration.

Cases belonging to the second class possess a peculiar and pressing importance, having been, until recently regarded as isolated, rare, and, when met with, as unexplainable. Though many hypotheses have been invented to account for their existence, they must now be regarded as fixed clinical facts. Experience cannot be controverted. Instead of a general paralysis of all of the muscles supplied by the recurrent nerve following its lesion, isolated paralysis of the abduction muscle alone can, and does, occur in a large proportion of cases. There is then a distinct proclivity on the part of the abductor filaments of the recurrent laryngeal nerve to become affected sooner than its others, or even exclusively, in cases of undoubted central or peripheral injury or disease of the roots or trunks of the pneumogastric, spinal accessory, or recurrent nerves (Semon). The question practically concerns the abductor filaments and the abductor muscles alone; for isolated paralysis of the adductor muscles, which receive, I believe, and, as I shall state, in a manner, their motor-force from the spinal accessory, mainly, if not wholly, from organic disease or pressure, is extremely rare (a case is reported by Türck, p. 437, of bilateral compression of this nerve in its passages through the foramen lacerum, by cancerous infiltration, in which hoarseness was the prominent symptom), and individual paralysis of the other laryngeal muscles (tensors and laxors) is, perhaps, invariably of myopathic origin. I deal here, then, with isolated paralysis of the abductor muscles of the glottis, unilateral or bilateral, the cause lying in central or peripheral lesion of the motor nerve-supply of the larynx. (These causes have been enumerated above.) The clinical fact is, as I have said, proven; the reason is now to be sought. The theory of the homogeneousness of the recurrent laryngeal nerve generally held is no longer tenable in the face of the fact just stated. As Semon truly remarks, were all its fibres identical, but different stimuli, coming either from the same or different centres, could be transmitted through them in every case in which there was an incomplete impairment affecting the roots or trunks of the spinal accessory pneumogastric or recurrent nerves, one and the same sequence only could be reasonably expected—viz., diminution of all the functions of all of the laryngeal muscles supplied with motor filaments by the recurrent laryngeal nerve, and this diminution in proportion to the number and strength of the fibres disabled by the disease-producing cause. But clinical facts and observation have proven that this is not the case; that even if such incomplete impairment does affect them, root or branch, certain fibrils, and therefore certain muscles alone, can be affected, to the exclusion of others; and we are forced by these facts to the conclusion that in order to produce such a result, the filaments of the recurrent nerve must be strictly differentiated throughout their course, surrounded by a common neurilemma, and even possess independent ganglionic centres of their own. In this view, it may be added, we are in entire accord with modern physiological investigation. Accepting it, we may discuss the cause of the curious proclivity which these filaments of the recurrent which go to the abductor muscles, show, in first, perhaps exclusively, yielding to a morbid condition, which apparently affects the whole nerve trunk or centre. This cause must lie in an inherent weakness to resist degenerative change; in a peculiar susceptibility to pathological influences; a specific vulnerability, if you choose, due to the feeble supply of motor force derived from external sources, and received by the adductor filaments of the recurrents; or in the fact that their centres, single and isolated, are first and most easily overwhelmed and destroyed by any central lesion. No other explanation which has been advanced covers the ground. Section of the spinal accessory nerve, usually regarded as the great source of motor power

supplied to the recurrents, is stated to be followed by paralysis of the adductor muscles alone, as shown in Bernard's experiments upon animals, loss of voice alone following its division. Hence it may be regarded as the particular and peculiar source of motor innervation of the adductor filaments. To paralyse the abductor muscles, section of the facial hypoglossal and first and second cervical nerves is necessary. The relations and anastomoses of the latter, with the recurrents, are by no means as large nor as extensive; nor is the relation as intimate as that of the former. Reasoning from these facts alone, we are led to believe that the abductor filaments of the recurrent must be the least powerful, being the most poorly supplied by motor innervation, and therefore more readily disposed to yield to any pathological cause which gives rise in the centres or course of the recurrents to degenerative change.

One of the explanations heretofore advanced to explain these cases—viz., that the adductor filaments receive an increment of nerve-force from the superior laryngeal, it will be seen is based essentially upon the same idea—viz., the superior motor and resistent power of one set of filaments of the recurrent nerve (the adductor) over the other. Such reinforcement can be but slight; but still it lends its aid in establishing the above described condition.

I cannot accept the view offered in explanation of these cases, that the arrangement of the fibrils in the recurrent nerves is a concentric one, and that the abductor filaments are situated in the periphery of the nerve, thus earliest and most directly exposed to injury from pressure or lesion. There is no precedent anatomically for assuming such an arrangement of a nerve. A series of microscopical sections of the recurrent nerves that I have had made does not show it, nor, indeed, any deviation from the well-known picture of the cross section of a nerve. Nor can I understand how any pressure, even the most discriminating, could just touch the peripheral fibres, destroy their conductivity, and leave others intact. I can see how it might set up degenerative changes in the weakest. It must be remembered likewise that the recurrent laryngeal nerve is a very small one, and that the character and nature of all the lesions above enumerated (aside from the central, which involve the roots) are such as not to press upon any limited point, but rather to stretch the nerve-trunk for some distance. Furthermore, such an explanation, were it true, would hold good only in cases of the lesion of the recurrent nerve alone; it would not be sufficient in cases of cerebral disease, nor in lesion of the pneumogastric or spinal accessory nerves. The theory of the morbid implication of an independent ganglionic centre—a respiratory centre situated in the brain and said to preside specially over the abductor filaments—being invariably the cause of isolated paralysis of the abductor muscles is at once overthrown, as an invariable rule, by the clinica fact that in a large number of the reported instances of paralysis and degeneration of the abductor muscles the lesion has occurred in the course of the recurrent nerve, and not at its centre. The seat of the morbid change which produces the isolated paralysis of the abductors lies in the nerve trunk, and has been here demonstrated. It may lie in its centre in certain instances, but in either case has not progressed far enough to destroy the conductivity of all of its fibres. It attacks, primarily at least, only those most disposed to yield to its influence. Furthermore, no such independent ganglionic centre has ever been located. It is useless, therefore, to discuss the point further. Facts supplant theory.

The whole question may be summed up thus: The proclivity of the abductor filaments of the recurrent nerve to undergo an internal retrogressive metamorphosis—becoming first, or even exclusively, diseased in cases of peripheral injury or disease involving the nerve trunk—depends upon

a specific vulnerability of these fibres or their centre to degenerative changes and ultimate loss of conducting power. This in truth is due to the feeble reinforcement of motor power which they receive from their centres or from supplementary sources. The proclivity of the isolated and unsupported centres for the abductors to yield to disease-producing causes is due to the greater resistance offered to the latter by the mutually co-operative and anatomically connected adductor centres, for certain centres being affected others stand ready to take their place; certain fibrils of the recurrents being destroyed, the united force of the centres is thrown into the remaining healthy ones. This proclivity is, moreover, analogous to the similar one of the extensor muscles of the extremities to become affected sooner than the flexors, or even exclusively in diseases of central origin. This explanation, it will be seen, covers the same ground and leads to the same results as the foregoing. In other words, aside from acute, complete lesion of the brain substance, are certain points which, affecting all routes of the recurrent and its supplementary sources of motor power, involving necessarily both adductor and abductor filaments, lead to complete paralysis of all laryngeal muscles; the nature and tendency in all the forms of lesion met with in the peripheral course of the nerve, and even in certain instances at its centre, is to incompletely affect it —certainly at first—and to gradually implicate those filaments which possess the least power of resisting the morbid impulse. These, as has been shown, are the abductor ones; isolated paralysis of the abductor muscles, unilateral or, more rarely, bilateral, according to the nature and location of lesion, is thus clearly established.

I ask your attention now to the third division of my classification. Cases of paralysis of individual muscles of the larynx exist of non-myotic origin, and independently of any lesion of the nerve centres, or of the nerve trunks in their course. The fact is, I believe, established; why should we ignore it in our present (with one exception) works upon the subject? The cause if sought for in the larynx, will be found to be a local one, and to lie in the implication of single nerve twigs by certain local lesions, such as ulcerations, gummy tumours, cicatricial contractions specially, the pressure of enlarged glands, and other such conditions which will suggest themselves, with degeneration and atrophy of the single muscle to which it or they are distributed. Anatomically, such a result is not difficult to explain, for you remember that the individual muscular branches of the inferior laryngeal nerve are only given off as the nerve itself enters the larynx. The deduction is obvious—in default of a demonstrable nerve lesion, exterior to the larynx, although the laryngoscopic signs of a paralysis exist, diagnostic refuge should not at once be taken in the hypothesis of the myopathic nature of its origin. That paralysis of a muscle may arise from intrinsic causes, that it may undergo idiopathic change of a degenerative character independently of any nerve lesion, modern microscopical, clinical, and post-mortem investigation and study have proven. Inflammation of any muscle may be either acute or chronic. The former, which it is true is rare, begins with parenchymatous swelling, and passes thence into suppuration and abscess. The latter is due to long continued and oft-repeated hyperæmia, and results in an overgrowth of the interstitial connective tissue and in changes in the muscular fasciculi. These vary; some retain their striation, and the nuclei of the sarcolemma are more numerous than normal. Others undergo cloudy swelling or fatty degeneration; and finally, in a few cases, most of the muscular fasciculi present the lesions of vitreous degeneration. Fibroid metamorphosis is well exemplified in the muscular changes seen after repeated rheumatic attacks, the mechanical irritation produced by continuous over-use or abuse of the voice, and in

syphilis of the larynx, aside too from such fibroid degenerations inflammatory in their origin. Others have been shown to exist that are certainly passive.

Let me pass now to specific examples. It is only necessary to remind you that muscles undergo certain idiopathic changes in typhoid fever, acute tuberculosis, cholera, and small-pox. Fatty degeneration is usually a chronic process, but acute fatty degeneration has been known to occur in at least one case of poisoning by phosphorus. Like instances are upon record from the toxic effects of arsenic and antimony. Again, syphilis is not unfrequent in the muscles, and is found to show characters varying according to the degree of its intensity, the stage of the inflammatory process, as well as the amount or extent of structure implicated—the same is true of malignant tumour and primary cancer of muscle.

Another phase of the question interests us. Modern neurology has demonstrated that many diseases, formerly regarded as neuropathic, are primarily myopathic. Thus, we are told that progressive muscular atrophy is due to a fatty degeneration of the muscular fibres; that pseudo-hypertrophic paralysis in early life is not a disease of the spinal cord, but rather a primary one of the muscular tissue, "a congenital nutritive and formative weakness of the striated muscle substance," and that in infantile paralysis the muscular fasciculi may in part completely disappear from a fatty degeneration. Examples might easily be multiplied, but those here given are sufficient to sustain the truth of the doctrine of myopathic change; and let me here adduce another curious and suggestive fact—viz., the analogy that may be shown between the well-known idiopathic degeneration of the heart muscle and perhaps a like change in the abductor muscles of the larynx, both muscles resembling each other closely in their involuntary and unremitting action. If these changes can thus be shown to occur in the muscular system generally, it is easy and proper to apply the laws which govern them to that of the larynx, not only because we have in it an organ peculiarly susceptible to many of the morbid conditions which are efficient factors in the production of degenerative lesions of muscle, but likewise because its muscular apparatus is wonderfully delicate in its construction, exposed in its situation, the subject of constant activity, and therefore readily involved by direct injury (Ott) by over-muscular exertion (specially exemplified in the case of the thyro-arytænoid muscles), by exposure to cold, and like causes. The immediate effect of the use of the laryngeal muscles, under these latter conditions, is to produce over-strain of the muscular fibre and temporary loss of contractile power; the remote, the cause persisting, is to bring about pathological change of a degenerative character. From the foregoing it would appear that the occurrence of idiopathic degenerative change in the laryngeal muscles can be established as beyond question; the fact that the seat of the disease lies in the muscle itself, that here it causes myotic change through which contractility is destroyed and consequently function abolished, is proved by intrinsic evidence. And though, as has been elsewhere said, it is possible that microscopical research may at a future period discover histological changes in the nerves which are beyond our present means of detection, it is not probable, and we are justified in basing our conclusions upon the premises of which we are to-day cognizant. The view then held above completely harmonizing, as it does, with clinical observation, commends itself as the correct one. Such cases cannot be regarded as neuroses, even in the widest acceptation of the term, and their consideration, conjointly with those of undoubted neuropathic origin, as is almost universally done, leads but to misconception and confusion. Rather let us constitute them a separate and distinct class, the fourth to which I call your attention.

The fifth class of case needs but a passing notice. It includes that form of paralysis which we designate as functional—dependent, it is true, upon deficient

muscular action; it is in no wise due to pathological lesion of nerve centre or trunk, nor interstitial myotic metamorphosis; but takes its rise in that curious psychical condition which we term hysteria. The one point concerning it upon which we would do well to seek an explanation is the reason of the curious predilection that the functional neuroses show for affecting the adductor muscles, for the number of cases in which hysterical paralysis of the larynx has affected alone the abductor muscles are so few and so doubtful that they only go to prove the rule.

Finally, I hardly regard it as necessary in the presence of this distinguished audience of experts to dwell upon the laryngoscopic signs met with in connection with the motor diseases of the larynx that I have described; although I should like, did time permit, to call your special attention to the diagnostic necessity of distinguishing between paralysis of the vocal cord and immobility due to mechanical impairment of the crico-arytænoid articulation. The matter is an important one; but I am all the more ready to leave it untouched, though to my regret, because a most excellent essay which has recently appeared (Semon) fully covers the ground.

The laryngoscopic signs of the paralysis are familiar to you all. Do the revelations of the laryngoscope need any exposition at my hands? Surely not. We recognize without difficulty the "cadaveric" position of the vocal cord, and its significance at once attracts our attention and bespeaks further investigation as to causation. So, too, of the varied positions and appearances of the vocal cords in the different paralyses due to lesion of individual muscles of the larynx. Does not the fixture of the vocal cords near the median line on attempted inspiration, their non-approximation on attempted phonation, indicate clearly the special muscular derangement? Will not the triangular opening between the vocal cords, posteriorly, in paralysis of the central adductor, the elliptical opening between them in paralysis of the internal tensors, and the wavy glottic line in paralysis of the external, all tell their own story clearly to the expert eye. And even if the paralysis do not occur in the simple forms here described—although the combination vary, and even spasm be associated with paralysis—will not the experienced observer be able to solve the combination from the variations in the shape of the glottis, and decompose, notwithstanding its difficulty, the permutations of which the laryngoscopic image is capable (Mackenzie). It would ill become me, gentlemen, in your presence, to think otherwise; and I, therefore, now leave my work in your hands for your discussion and judgment. The suggestions that I have made are tendered with a feeling of good will and strong desire to aid in our common work—would that they were more worthy of your acceptance.

DISCUSSION.

Dr. George Johnson, London: One of the many points of interest connected with this question is the curious fact that occasionally a bilateral paralysis observed during life depends on a lesion of the trunk of one vagus only; and here I may refer to a case of my own in which a bilateral paralysis of the abductors was found post-mortem to depend on an aortic aneurism involving the left pneumogastric nerve only. The only possible explanation of these cases is that the irritation conveyed by the afferent filaments to the centres sets up such disturbance there as passing along the efferent filaments to both sides causes paralysis. In my case the nerve centres were not examined, and I would urge on the members in such cases in future to examine especially the nerve centres of the spinal accessory, vagus and other nerves implicated. It is an acknowledged fact that a primary disease of the nervous centre may cause bilateral palsy

of the laryngeal muscles, and it can scarcely be doubted that a central disease, the result of peripheral irritation, may have the same result.

Dr. OTTOMAR ROSENBACH, Breslau: From a case of bilateral paralysis of the recurrent laryngeal nerve, which I communicated to the *Breslauer Aerztliche Zeitschrift* of 1880, the following conclusions can be drawn:—1. In all cases of total paralysis of the recurrent nerve, the abductors suffer first, in the same manner as in all other cases of paralysis of nerves or nerve centres, first the extensors and abductors are paralysed. The sphincters to which, in the larynx, the adductors correspond are only attacked, it is well known, quite at the last by paralytic affections. 2. The stridor and the approximation of the vocal cords in paralysis of the crico-arytenoidei postici are produced by a perverse rhythmical innervation of the glottis-closers; it cannot be produced by differences in the pressure of air above and below the vocal cords, for in the case from which the conclusions are drawn, the stridor and the approximation of the vocal cords ceased when the vocal cords assumed the cadaveric position (the same conditions were present here as in the production of contractions in the extremities). 3. Paralysis of the recurrent nerve and cadaveric position are not identical ideas, if one does not admit that the crico-thyroid muscle is also innervated by the recurrent laryngeal nerve.

Dr. FELIX SEMON, London: I am very pleased that my own observations on the proclivity of the abductor fibres have been so fully accepted by both the gentlemen who introduced the subject; but though I have recently had the opportunity of corroborating by a good many new observations my previous statements, I would, with Professor Gerhardt, advise that we should at the present refrain from attempts at explaining, at any price, the curious fact. It is certainly not yet time to rush into hypotheses when the fact itself of the occurrence of an isolated paralysis of the abductors is doubted. I hope that after the public demonstration, on the previous day, of five such cases, which only form a part of the sixteen I have observed during the past five years, these doubts will cease. The practical gain already accruing now for the general practitioner, if the fact of the proclivity of the abductors to submit earlier, or even exclusively, to all forms of organic disease, whether central or peripheral, is established, will be the following dictum: Position of an immovable cord in the median line (if not occasioned by myopathic or mechanical disorder) points to organic disease, central or peripheral; position at the side of the larynx to functional or local disorder.

Professor SCHNITZLER, Vienna: I agree with Professor Gerhardt that hysterical paralysis of the vocal cords is due to a functional disease of the central nervous system, a proof for which is that I have sometimes been successful in such cases when using central galvanization, in which long-continued local use of electricity had been without avail. I have made observations similar to that of Dr. Johnson (see *Wiener Klinik*, 1878). I am disposed to believe that bilateral paralysis of the recurrent laryngeal is scarcely so frequent as one is induced to believe from the description of the many cases recorded in literature. Some of them would hardly withstand a severe scientific criticism.

Dr. BOSWORTH, New York: We are told that there is a distinct proclivity on the part of the abductor muscles to paralysis; that the most common lesion found is pressure on the recurrent nerve; therefore, that we must attribute the disease of bilateral paralysis to pressure on the recurrent nerve, and that

this pressure so far differentiates the nerve fibres as to press upon those passing to the abductor muscles. Dr. Johnson, in the interesting case narrated, has given, to my mind, a truer explanation, and one which I adopted some time ago in writing on the subject. Recurrent laryngeal paralysis—unilateral or bilateral—gives rise to a totally different condition from abductor paralysis. Pressure on the recurrent must necessarily implicate the fibres passing to the adductor. The serious feature of bilateral paralysis of the abductors is in the integrity of the adductors producing that glottic closure which gives rise to the peculiar dyspnœa which characterises abductor paralysis. The abductor muscles are closely analogous to the heart, in that they are in a state of constant functional activity. Like the heart muscle, then, they are liable to degenerative change, and in this then we find an explanation of what is called their proclivity to paralysis. This is, I think, precipitated by disease or pressure implicating one or both recurrent nerves in a small proportion of cases. In a majority of cases, however, we must look for a lesion involving that portion of the respiratory centres which presides over the glottis opening function of the larynx.

Professor Burow, Königsberg: Apart from the unilateral cases, I have observed nine to ten bilateral total paralyses of the glottis-openers. Two of them were examined post-mortem; in the first there were two large masses of glands found in the neck, and total macroscopic and microscopic atrophy of the posterior crico-arytenoid muscles, whilst the brain was quite healthy; in the second case there was bilateral compression of the recurrent nerve by an œsophageal carcinoma. The explanation hitherto given for the proclivity of certain filaments of the recurrent nerve to succumb first to a compression of the whole nerve trunk, seems to me to be less of the nature of explanation than of that of a circumscription; the really essential factor is as yet unknown to us. In opposition to Dr. Rosenbach I wish to state that the preponderance of the adductors explains the approximation of the vocal cords during inspiration, as it becomes plainly visible in extreme cases that they become simultaneously arched downwards, which is evidently a consequence of the positive atmospheric pressure from above and the negative from below.

Professor Gerhardt and Professor Lefferts briefly replied, urging the importance and necessity of a further study of the subject.

Die Sensibilitäts-Neurosen des Schlundes und Kehlkopfes.

Prof. Schnitzler, Vienna.

Empfindungs-Anomalieen dieser Theile sehr häufig. Gewöhnliche Erscheinungsformen der Sensibilitätsneurosen (Hypaesthesie, Anaesthesie, Hyperaesthesie, Hyperalgesie, Paraesthesie) auch hier beobachtet. Bisweilen keine strenge Trennung zwischen den einzelnen Formen möglich. (Ungenauigkeit subjectiver Angaben; Uebergehen einer Form in die andre etc.) Oft diese Neurosen vergesellschaftet mit solchen in benachbarten Organen; oder Ausgangspunkt resp. Theilerscheinung von allgemeiner Sensibilitätsneurose.

Charakteristik der subjectiven Symptome der einzelnen Formen. Association von Krampfhusten, Stimmlosigkeit, Schlingbeschwerden. Objective Symptome meist ganz negativ oder doch gering und ausser Verhältniss zu subjectiven Beschwerden. (Hyperämie, Anämie, Katarrh, Reste abgelaufener Entzündungen etc.)

Ursachen theils central, (Erkrankungen des Gehirns und Rückenmarks, Hysterie, Hypochondrie—beide letztere aber häufig auch *Folgen* der Neurosen) theils peripher (Erkrankungen des Pharynx und Larynx). Zwischen beiden steht die Diphtherie.

Therapie in erster Linie gegen Grundleiden zu richten. Local: beruhigende Inhalationen und Pinselungen, subcutane Injectionen, Adstringentia, Caustica. Detaillirung der einzelnen Indicationen. Vorzüglichstes Mittel in den meisten Formen: Electricität, besonders constanter Strom.

Neuroses of Sensation of the Pharynx and Larynx.

Professor Elsberg, New York.

Alphabetically arranged literature of the subject.

Definition:—Disordered sensibility of the throat, functional and not merely symptomatic. (The word "functional" does not imply with the author that there is no physical basis for the particular derangement of function, but that the structural change is either remote from the organ, the function of which is deranged, or that it is not discernible with the means of observation at our command.) The definition excludes, on the one hand, cases of neuritis and observed alteration of nerve tissue of the throat; and on the other, throat neuroses, which have no other than a symptomatic significance, as the increased sensibility and painfulness in inflammatory affections, the diminished sensibility in connection with the failure of all the powers, such as during an epileptic fit, in cholera, and in approaching death from any cause, and the perverted sensibility of confirmed insanity, or that occasioned by the actual presence of foreign bodies, tumours, &c.

Anatomico-physiological basis:—Many questions relating to the normal and pathological sensibility of the larynx, pharynx, and other constituents of throat not yet definitely settled. What normal sensation involves. The deviation and distribution of the sensory nerves of the throat. Hypothetical sensory nucleus of Spitzka; his reasons. Variations of normal sensibility in different persons, and different portions of the throat. Pieniaczek's experiments. Investigations with "throat æsthesiometer." Krishaber's distinction between common or general sensibility and reflex or special sensibility.

The author's discrimination between tactile, dolorous, and reflex sensibility; the first appreciating temperature and pressure, the second pain, and the third leading to muscular contraction and vascular and secretory action, each of which may be either diminished, increased, or perverted.

Classification:—

- Disordered Sensibility: Dysæsthesia
  - A. In reference to the Quantity or Degree of Sensation
    - I. Diminished Sensibility: Hypæsthesia
      - 1. Anæsthesia
        - Complete Anæsthesia
        - Anæsthesia Dolorosa
        - Analgesia
      - 2. Tactile Hypæsthesia
      - 3. Reflex Hypæsthesia
    - II. Increased Sensibility: Hyperæsthesia
      - 1. Tactile Hyperæsthesia
      - 2. Algesia
        - In response to external impression
        - Spontaneous (Neuralgia)
          - Constant
          - Intermittent (or true Neuralgia)
      - 3. Reflex Hyperæsthesia
        - Muscular Contractions (cough, gagging, spasm, &c.)
        - flushing, paling, hypersecretions
  - B. In reference to the Quality or Kind of Sensation
    - III. Perverted Sensibility: Paræsthesia

Explanations:—Reasons why neuralgia is considered under the second subdivision of hyperæsthesia.

Occurrence:—Frequency. Diseases in which sensory neuroses of the throat have been observed.

Causes and Pathogeny:—Remote and immediate causes. Suggestions of Andrew H. Smith. Central and peripheric origin.

Symptoms and Diagnosis:—Subjective and operative. Various auxiliary means for diagnosis. Care necessary, on the one hand, not to overlook local lesions; and on the other, not to mistake for the latter what is the reflex effect of the dysæsthesia.

Prognosis:—In many cases very grave, in others duration uncertain. Complete cure occurs, but not frequently.

Treatment:—Instrumental, medicinal, electrical.

DISCUSSION.

Dr. B. Fränkel, Berlin: I am of opinion that it is absolutely necessary to differentiate between hyperæsthesia and paræsthesia, because paræsthesia also occurs associated with anæsthesia. I would further urge the causal connection between hypochondriasis and pharyngeal diseases, especially those of the retronasal region. The abnormal sensations which originate here, and which are associated with the feeling of pressure and heaviness in the head, produce mental depression and well-marked hypochondriasis, which again can be cured from the pharynx.

Dr. Tornwaldt, Danzig: I have seen a considerable number of cases in which, by hyperæsthesia originating from diseases of the pharynx, or of the naso-pharyngeal cavity, a reflex cough was produced. It is especially in cases of granular pharyngitis, still more so in the lateral form of this disease, as described by Schmidt, in which, by touching the granulations, cough is produced, and in which, by getting rid of the granulations, the cough is permanently abolished.

Dr. Bayer, Brussels: With regard to the remarks which have just fallen from Dr. Tornwaldt, my paper to be read in the afternoon contains communications concerning this point.

Professor Schnitzler: In a clinical point of view, the finer differentiations of the individual forms of the sensory neuroses cannot always be strictly carried out, the less so because most of the forms frequently occur combined with one another. As regards the relationship between neuroses of sensation and those of mobility, especially of paralysis and spasm of the glottis, I would refer for details to my paper on this subject shortly to be published.

Les indications pour le traitement extra ou intralaryngé des polypes du larynx.

Dr. Ch. Fauvel, Paris.

Il est bien entendu que la question que vous m'avez fait l'honneur de me donner à résoudre ne comporte que l'étude des opérations relatives aux polypes du larynx et non aux tumeurs du larynx.

A la page 224 de mon traité des maladies du larynx—en 1876—je disais que l'operation d'Ehrmann devait être regardée à juste titre, en 1844 comme une des plus belles de la chirurgie, mais passerait maintenant pour une opération barbare.

Je n'ai pas changé d'avis, et je déclare aujourd'hui comme alors que presque toujours l'on doit et l'on peut opérer les polypes du larynx par la voie, par le chemin que nous offre la nature.

Il ne faut suivre une autre route que si la voie naturelle est obstruée, barrée, encombrée, infranchissable, impracticable.

Laissez-moi, messieurs, vous faire une comparaison: Si un voyageur a deux routes à suivre pour arriver à son but, l'une un peu longue mais sûre, exempte de dangers, l'autre plus courte mais dangereuse, pleine de périls, quelquefois mortelle, laquelle préférera-t-il?

La première évidemment. Nous devons donc faire comme le voyageur prudent, nous y sommes d'autant plus obligés, qu'il s'agit non pas de notre propre existence, mais de celle du malade qui s'est confié à nous, et dont la vie doit nous être sacrée.

Un de nos confrères, spécialiste très-distingué de la ville de Lyon, nous a raconté à ce propos qu'un jeune malade de Lyon, chez qui il avait diagnostiqué un petit polype d'une corde vocale, qui aurait pu être facilement enlevé avec les pinces laryngiennes, avait été opéré par un des premiers chirurgiens de la ville par les voies artificielles, et ce malade est mort trois jours après l'opération Le spécialiste s'appelle le docteur Blanc, vous connaissez ses travaux; je regrette qu'il ait été empêché de venir prendre part à notre congrès. Le chirurgien qui a fait l'opération—permettez-moi de ne pas vous le nommer.

Jamais je n'ai vu d'accidents après l'oblation des polypes du larynx par les voies naturelles, et souvent il en est arrivé par la méthode extra-laryngée.

Les indications pour le traitement intra-laryngé sont donc très-fréquentes Dans la presque généralité des cas l'indication du traitement intra-laryngé est formelle, évidente, indiscutable. Chaque fois que le médecin pourra introduire par les voies naturelles jusque dans l'organe vocal à la rencontre des polypes les instruments nécessaires à la destruction de ces tumeurs, il devra le faire sans conteste; ce n'est que dans le cas où l'introduction de ces instruments est impossible que l'opérateur devra se résigner à ouvrir une voie artificielle, c'est-à-dire extra-laryngée.

Ces cas me semblent excessivement rares; il faudrait supposer une déformation ou une malformation congénitale acquise ou accidentelle traumatique l'entrée du larynx ou du pharynx ou de la base de la langue.

Il serait trop long de passer ici en revue tous les obstacles apportés l'opération intra-laryngée. Je ne les ai jamais rencontrés, il faudrait supposer une des maladies suivantes:

1.—Une glossite ou une maladie quelconque de la langue ayant amené une telle hypertrophie de cet organe qu'il remplit la bouche, et empêche passage des instruments par la cavité buccale.

2.—Ou encore une ankylose des mâchoires ou une maladie ou des articulations temporo-maxillaires empêchant le malade d'ouvrir la bouche malgré plus grands efforts.

3.—Une tumeur ou gonflement de la voûte palatine, du voile du palais la luette, des amygdales.

4.—Une maladie de l'épiglotte obstruant le vestibule laryngien.

5.—Une affection de la région susglottique, des replis ary-épiglottiques la région aryténoïde, des cordes vocales supérieures ou des ventricules.

Les indications pour le traitement extra-laryngé sont très-rares; résumé—ne se résoudre, ne se résigner à l'opération extra-laryngée

lorsqu'il est absolument, matériellement impossible de ne pas introduire l'instrument dans la glotte par la voie naturelle, et lorsque le malade est menacé de suffocation, d'asphyxie, pouvant entraîner rapidement la mort.

Encore même : dans ce cas il sera toujours mieux de procéder d'abord à la trachéotomie.

Ce n'est que lorsque la trachéotomie, par extraordinaire, serait regardée comme dangereuse, impossible, dans un cas particulier, tout-à-fait spécial, comme dans le cas de goître, de déviation de la trachée, de déformation ou de maladie quelconque du conduit trachéal qu'il faudrait pratiquer la cricotomie, la crico-thyrotomie, la thyrotomie ou la thyro-hyotomie.

J'ai fait une fois la thyrotomie chez un malade atteint de papillomes nombreux, volumineux, repullulant sans cesse malgré des arrachements journaliers. Craignant de le voir étouffer, je pratiquai d'abord la trachéotomie ; j'étais donc certain de ne plus le voir s'asphyxier, et je pris le parti de fendre le cartilage thyroïde en avant dans toute sa hauteur ; je fus obligé de pratiquer plus de trente ligatures de petites artères, car vous le savez, quand un organe est atteint de tumeurs anciennes végétantes, les tissus du voisinage s'hyperémient considérablement. Après avoir pratiqué toutes ces ligatures et avoir séparé les deux plateaux du cartilage thyroïde, j'eus beaucoup de peine à les écarter l'un de l'autre de quelques millimètres seulement, c'est à peine si l'intervalle permettait d'introduire les deux pointes d'un ciseau fermé. Je passais alors à travers chaque plateau du thyroïde, un gros fil d'argent, et j'espérais ainsi et tirant fortement les fils de chaque côté en arrière du cou obtenir une ouverture assez grande pour manœuvrer librement les branches des ciseaux, la boutonnière interthyroïdienne fut toujours trop étroite, et je ne pus pas enlever toutes les végétations polypeuses. Je craignais plusieurs fois de voir fracturer les ailes du cartilage thyroïde en tirant sur les fils d'argent qui servaient par leur tension à obtenir l'écartement des bords de mon ouverture extra-laryngée. Vous voyez combien l'opération fut longue, douloureuse, difficile.

Si vous comparez d'une part ainsi que le fait, très-bien observé notre honorable confrère M. le Professeur Burow de Königsberg, les dangers que présentent les opérations extra-laryngées à la parfaite innocuité des opérations intra-laryngées ; si vous songez que dans le premier cas le malade est exposé à tous les accidents primaires et secondaires d'une grave opération, qu'il est obligé d'interrompre ses occupations ; tandis que dans le second cas il ne court aucun risque, n'a même pas de fièvre, peut boire, manger, aller à ses affaires, continuer ses travaux sans interruption, vous donnerez la préférence au traitement intra-laryngé.

Indicationen für extra- oder intralaryngeale Behandlung gutartiger Neubildungen im Kehlkopf.

Professor Burow, Königsberg.

Hochgeehrte Versammlung !—Wenn ich es heute versuche der ehrenvollen Aufforderung unseres Comités nachzukommen, und durch einige Worte in Gemeinschaft mit Herrn Collegen Fauvel die Discussion über den fünften Punkt unseres Programms "die Indicationen für extra-oder intralaryngeale Behandlung gutartiger Neubildungen im Kehlkopf" einzuleiten, so muss ich bekennen, dass ich mich einigermassen der geehrten Sektion gegenüber in Verlegenheit befinde.

Denn obgleich ich Anfangs, als ich dieser Frage nahe trat, eigentlich zweifelhaft war, ob nicht die Ansichten über die Antwort auf dieselbe in den letzten Jahren bereits sich so weit geklärt und geeinigt hätten, dass in der That ein Zweifel kaum mehr obwalte, fand ich im Gegentheil bei genauerem Studium

der Literatur so überaus verschiedene, ja strikte entgegengesetzte Meinungen vertreten, dass es mir nun kaum möglich schien mit wenigen Worten eine Ausgleichung der Differenzen, eine Beilegung des Streites zu erzielen.

Wir finden nicht nur die Laryngologen von Fach und die Chirurgen von sehr verschiedenen Meinungen über die in Rede stehende Frage occupirt,—das wäre ja ziemlich natürlich,—sondern auch selbst die Laryngologen unter sich sind so sehr uneins, dass während einzelne den grösseren Procentsatz ihrer Neubildungen durch die Thyrotomie entfernen, andere unter keinen Umständen diese "barbarische Operation" für indicirt halten.

Und ich will hier gleich offen Farbe bekennen und eingestehen, dass, wenn ich auch die Thyrotomie für eine bei Weitem gefährlichere Operation zu halten veranlasst bin, als allgemein angenommen wird, und wenn ich auch fest glaube, dass in der überwiegenden Mehrzahl der Fälle sowohl bei Erwachsenen, als bei Kindern die Entfernung gutartiger Neubildungen vom Munde aus möglich ist, ich doch zugeben muss, dass in einigen wenigen Kategorien die Laryngofission nicht zu umgehen sein wird.

Diese Kategorien nun möglichst zu fixiren, und wie ich wohl sagen kann, möglichst einzuschränken, soll ja eben heute der Zweck unserer Discussion sein.

Ganz genau präcisirte Indicationen, die keinem Zweifel, keiner Verschiebung unterworfen sind, zu stellen, halte ich heute noch für zu früh! Es wird noch viele Jahre des Beobachtens und Forschens erfordern, ehe wir mit voller Sicherheit werden sagen können: in diesen Fällen muss oder darf thyrotomirt werden, in jenen nicht!

Bei genauerer Sichtung des Materials finden wir, dass in letzter Zeit die Vorliebe für die Thyrotomie immer mehr abgenommen hat, und es ist ein nicht geringes Verdienst von Bruns jun., durch die Zusammenstellung und rationelle Sichtung der hierhergehörigen Operationen in seiner Arbeit "die Laryngotomie zur Entfernung intralaryngealer Neubildungen" wesentlich zur Klärung der Situation beigetragen zu haben.

Wenn wir nun der Frage näher treten, so glaube ich über die Zweckmässigkeit, Ausführbarkeit, Technik und Ungefährlichkeit der intralaryngealen Methode wohl nicht viel anführen zu dürfen, denn darüber sind wir ja alle einig, dass es stets wünschenswerth sein wird, alle gutartigen Neubildungen vom Munde aus zu entfernen.

Es wird sich gerade darum drehen, festzustellen, wie weit wir der extralaryngealen Methode das Terrain streitig machen können; und um das zu können, müssen wir uns über die verschiedenen Arten dieser Methode, ihre Gefahren für das Leben und für die Funktion des Organs, den Grad der Sicherheit gegen Recidive u. s. w. klar werden.

Vor Allem möchte ich die Thyrotomie von den anderen extralaryngealen Operationsmethoden strenge scheiden, und zuvörderst nur von der ersteren handeln; denn ich bin der Meinung, dass sowohl die Lebensgefahr, als die Berechtigung für diese verschiedenen Arten der Eröffnung der Luftwege eine wesentlich differente ist. Bruns stellt in seiner bis Ende 1877 reichenden Statistik circa hundert Fälle von Thyrotomie etwa tausend Fällen von endolaryngealen Operationen entgegen, und kommt, auf Grund seiner statistischen Berechnung zu dem Schluss, dass diese Operation zu den "grösseren Operationen von der allergeringsten Lebensgefahr zu rechnen sei," da er im Gegensatz zu früheren Autoren auf diesem Gebiet, durch Ausschaltung mancher zweifelhafter Fälle nur 3 per Cent. Todesfälle (in Folge unmittelbarer Operationsfolgen) herausrechnet, während z. B. Mackenzie 8 per Cent annahm. Seit jener Zeit ist ein Fall von Johnson* in Chicago mitgetheilt worden, in welchem

* *Archives of Laryngology*, 1880, No. 1, page 58.

ein dreijähriges Kind acht Tage nach der wegen eines wahrscheinlich congenitalen Papilloms ausgeführten Thyrotomie an Pneumonie starb.

Wie viele tödtliche Fälle sind wohl aber unpublicirt geblieben! Dieser Einwurf Ielenffy's scheint mir volle Berechtigung zu haben. Denn es haben gewiss viele Operateure keinen zwingenden Grund eingesehen, ungünstige Erfolge nach dieser Operation sofort mitzutheilen, da sie ja an und für sich keine so sehr interessante oder schwierige ist, dass in diesem Umstande eine Aufforderung zur Publication zu finden wäre. Ich selbst befinde mich in dieser Lage. Denn ich habe dreimal die Thyrotomie gemacht, und alle drei Patienten starben mir an unmittelbaren Operationsfolgen, und zwar eine 62jährige Dame am dritten Tage, nachdem bis dahin Alles gutgegangen, plötzlich, in welchem Falle leider die Section verweigert wurde; eine 26jährige Frau, in Folge von Erstickung durch einen secundären Abscess, der sich an dem nekrotisirenden Ringknorpel gebildet hatte, und consecutivem Glottisödem,* und ein 46jähriger Mann am vierten Tage, in Folge einer Nachblutung aus der Umgebung der Wunde, für welche die genaueste Section keinen Anhalt bot. Wenn wir aber nur diese vier Todesfälle zu den von Bruns nach schärfster Sichtung des Material angegebenen hinzufügen erhalten wir 7 per Cent., und haben wir dann noch ein Recht zu behaupten, dass die Thyrotomie eine sehr wenig gefährliche Operation sei?

Und ich glaube nicht zu irren, wenn ich behaupte, dass manche der hier anwesenden geehrten Collegen im Stande sein werden, aus ihrer operativen Praxis diesen Procentsatz noch wesentlich zu verschlechtern.

Auch finden wir bekanntlich "fast tödtliche Blutungen während der Operation" selbst von den eifrigsten Vertheidigern der Laryngofission notirt. Hierbei möchte ich erwähnen, dass in den von mir operirten Fällen die Trendelenburg'sche Tamponkanüle so absolut den Verschluss bewirkte, dass ich die Larynxhöhle nach Auseinanderziehen der Schildknorpelhälften wiederholt und energisch mit Eiswasser irrigiren konnte, ein Umstand, der nicht nur die Gefahr von Seiten des hinunterfliessenden Blutes ausschliesst, sondern auch die Operation sehr erleichtert, weil nach jedem Schnitt oder Abquetschen eines Stückes der meist breitbasig aufsitzenden Papillome, auftretende Blutungen die Vollendung und exakte Durchführung der Excision bedeutend erschweren.

Die von manchen Seiten betonte Behinderung durch Starrheit der Schildknorpelplatten, so dass sie nicht genügend auseinander gezogen werden können, war in meinen Fällen nicht wesentlich. Nur muss man nicht gar zu viel erwarten, da die in der Nähe der oberen Apertur der Cartilago thyreoidea inserirende Epiglottis nur zum Theil gespalten wird und mit ihrem ungetrennten Theil wie eine Feder einer beträchtlichen Dilatation entgegenwirkt. Auch ist es ein Fehler Rückschlüsse von Uebungen an Leichen zu machen, da am Lebenden wohl in Bezug auf Muskelspannung, Turgescenz der Theile, u. s. w., völlig differente Verhältnisse obwalten.

Die Thyrotomie (*i.e.* die totale) muss, meiner Ansicht nach, zu den grösseren Operationen von nicht zu unterschätzender Lebensgefahr gezählt werden.

Ihre ungünstige Prognose in Bezug auf Recidive bei Papillomen ist von allen Seiten sicher gestellt worden.

Indessen nur bei Mackenzie findet sich der Umstand ins Bereich der Erwähnung gezogen, dass doch schliesslich mit seltenen Ausnahmen der Thyrotomie gerade die schwersten Fälle unterworfen werden, gerade die Fälle, in denen multiples Vorkommen breitbasig aufsitzender Papillome *à priori* grosse

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* Es war die Kanüle bereits entfernt, und Patientin hatte die Klinik verlassen; sie verweigerte auf das Positivste die Wiederöffnung der Trachealfistel, trotzdem ihr die sicher eintretende Suffocation vorhergesagt war.

Chancen für Recidive darbieten; wir dürfen nicht in den Fehler verfallen der Operation ungünstige Erfolge zur Last zu legen, die in dem Charakter des Falles bedingt sind.

Wenn wir ein den grössten Theil der Kehlkopfsschleimhaut einnehmendes Papillom operiren, so werden wir in der Regel Rückfälle erleben, mögen wir eine Operationsmethode wählen, welche immer wir wollen!

Es kommt nun dazu, dass wir bei der Thyrotomie die Ausrottung in einem Ackte vollenden müssen, also um so leichter ein kleines Stellchen übersehen können, das später Anlass zu einem continuirlichen Recidiv giebt, während bei der endolarygealen Methode wir in der Zeit und beliebigen Wiederholung der Operation unbeschränkt sind.

Aehnlich wie für die Wahrscheinlichkeit der Recidive sind die Erfolge der Thyrotomie in Bezug auf Wiederherstellung der Funktion des Organs ungünstig. Und hier verhält sich die Sache noch in so fern anders und schlimmer, als nicht nur die an und für sich ungünstigere Form und Sitz derjenigen Tumoren, welche vorzugsweise die Thyrotomie indiciren, die Schuld an häufig zurückbleibender Stimmstörung tragen, sondern die directen Operationsfolgen selbst dieses ungünstige Ereigniss bedingen.

Denn nicht nur, dass zuweilen eine geringe Abweichung des Schnittes von der Mittellinie schwer zu vermeiden sein dürfte, zumal bei Ossification der Knorpel im höheren Alter, sondern es kann auch Aphonie herbeigeführt werden, selbst bei ganz genauer medianer Schnittführung, in Folge "nicht ganz genauer oder nicht ganz fester Wiederverwachsung des Schildknorpelwinkels durch Veränderung der Insertionspunkte und Spannungsverhältnisse der Stimmbänder." *

Desshalb sollte man nie eine Thyrotomie machen zum Zwecke der Ausrottung benigner Neubildungen, wenn nur die Stimmstörung die Indication abgiebt, da man nie Garantie leisten kann, ob nicht trotz Entfernung des Tumors eine ebenso starke—und dann unheilbare—Heiserkeit fürs ganze Leben zurückbleiben wird.

Aber auch mit der Erleichterung für die Entfernung der Tumoren steht es für die Thyrotomie keineswegs so günstig, wie man im ersten Augenblick denken sollte. Es sind manche Fälle mitgetheilt, so von Beschorner, Péan, Laroyenne, Cutter u. A., in denen die Operation unvollständig blieb, weil die zu geringe Breite, bis zu der die starren Schildknorpelhälften das Auseinanderfedern gestatteten, die Blutung und die Reizbarkeit der Schleimhaut trotz Narkose, eine totale und reine Exstirpation unmöglich machten.

In anderen Fällen sind ausdrücklich die grossen Schwierigkeiten betont, die sich der totalen Exstirpation entgegenthürmten. Das gilt von der totalen Thyrotomie.

Ganz zu verwerfen ist aber meiner Ansicht nach noch die partielle. Ausgehend von der Idee die ungenauere Wiedervereinigung der Platten dadurch unmöglich zu machen, schlug man vor und versuchte es vielfach die Spaltung nicht bis zur oberen Incisur zu führen, sondern hier einige Millimeter stehen zu lassen. Aber, wie es jedem, der die Thyrotomie am Lebenden ausgeführt hat, *à priori* klar sein musste, war hierdurch nur ein ungenügender Raum zu beschaffen und auch nur das Gebiet unterhalb und bis dicht an die Stimmbänder zu berühren, was übrigens durch eine andere absolut ungefährliche Operation: die Eröffnung des ligament. conoideum viel besser zu erreichen ist. Die partielle Thyrotomie ist also ganz zu verwerfen.

Auch die längere Dauer, ein gewöhnlicher Einwurf gegen die endolaryngeale Methode erscheint uns in wesentlich anderem Lichte, wenn wir der

* Bruns, l. c., p. 99.

Sache auf den Grund gehen. Es ist zwar nicht zu läugnen, dass die Fälle, in denen es möglich ist Neubildungen schon in den ersten Sitzungen zu entfernen, zu den Seltenheiten gehören, dass vielmehr durchschnittlich drei Wochen hierzu erforderlich sind. (Eine Ausnahme von dieser Regel scheint die Anwendung des Voltolini'schen Vorschlags in manchen besonders günstigen Fällen zu gestatten, mit einem Schwämmchen gleichsam ohne Spiegel die Polypen wegzuwischen.)

Indessen, wie lange ist denn ein Kranker dem wir die Laryngotomie gemacht haben, ans Bett und Zimmer gefesselt? Doch jedenfalls mehrere Wochen und hier kommt noch dazu, dass die endolaryngeale Methode nicht am Herumgehen, resp. der Ausübung seiner Geschäfte hindert.

Das wäre nun in Bezug auf die Würdigung der Thyrotomie im Allgemeinen das wichtigste. Betrachten wir nun einmal umgekehrt die gewöhnlich als Contraindicationen gegen die endolaryngeale Methode angeführten Eigenschaften der Tumoren!

Hier muss ich constatiren, dass die meisten noch vor wenig Jahren aufgestellten Behauptungen sich als hinfällig erwiesen haben, so dass auch hier die endolaryngeale der thyrotomischen Methode den Boden unter den Füssen fortzieht.

Denn wenn noch vor acht Jahren Hüter in seiner Bearbeitung dieses Capitels im "Pitha-Billroth'schen Handbuch" sagen konnte: "die kleinen und schmalgestielten Polypen am freien Rande der Stimmbänder seien das einzige berechtigte Gebiet der endolaryngealen Methode, alle übrigen Geschwulstformen müssten eigentlich der extralaryngealen Methode anheimfallen," so müssen wir nach den seither gesammelten Erfahrungen unser Urtheil heute wesentlich anders formuliren. Eine breite Basis der Schleimhautpolypen kann wohl die vollständige Entfernung derselben per vias naturales erschweren, aber keineswegs verhindern. Es stehen uns die verbesserten Instrumente, namentlich auch die Galvanocaustik, hier hülfreich zur Seite und viele Krankengeschichten illustriren die erfolgreiche Bekämpfung dieser Schwierigkeit.

Fibröse Beschaffenheit der Neubildung, selbst hohe Grade der Härte, wie sie derbe Fibrome oder Enchondrome darbieten, lassen sich durch Guillotinen überwinden. Das Wurzeln der Tumoren in der Tiefe der Morgagni'schen Ventrikel scheint ebenfalls keine Indication für die Thyrotomie; denn sind die Geschwülste noch sehr klein, so sind die durch sie hervorgebrachten Beschwerden zu gering, um eine so eingreifende Operation zu rechtfertigen; bei stärkerem Wachsthum aber drängen sie sich aus den Ventrikeln hervor, werden gewissermassen geboren, und lassen sich dann entfernen.* Auch selbst der Sitz der Tumoren unterhalb der Glottis ist an und für sich keine absolute Indication für die Laryngofission. Es sind mehrfach erfolgreiche Operationen an subglottischen Tumoren auf dem natürlichen Wege mitgetheilt worden. Hohe Dyspnoë erfordert die sofortige Tracheotomie; man säume mit derselben nicht und versuche namentlich keine Eingriffe per os vor Ausführung derselben, damit nicht consecutive Erstickungsanfälle diese Versäumniss rächen; aber eine absolute Indication für die Thyrotomie geben sie ebenfalls nicht. Der tracheotomirte Kranke kann jetzt mit Ruhe und Sicherheit auf dem natürlichen Wege geheilt werden.

Bedeutender Umfang der Tumoren kann uns nicht veranlassen der Laryngofission den Vorzug zu geben, ebenso wenig, wie Multiplicität der Papillome. Denn im ersten Falle können wir nach vorausgeschickter Tracheotomie vom Munde aus arbeiten, und wir sahen auch, dass gerade die Spaltung der Schildknorpel für sehr grosse Geschwülste nicht genug Raum schafft, und die letzte

* "Mein Atlas," Taf. vi. Fig. 6.

Schwierigkeit ist bei Erwachsenen, wie auch bei Kindern durch Ausdauer zu überwinden.

Noch auf dem letzten Chirurgencongress in Berlin theilte Böcker einige Fälle mit, in denen er per vias naturales operirend es ermöglichte Geschwülste so rein zu entfernen, dass die Kanüle fortgelassen werden konnte, die die Patienten nach früher ausgeführten Radicaloperationen (Laryngofission und Pharyngotomia subhyoidea) hatten Jahre lang tragen müssen.

Also nicht jede der hier genannten erschwerenden Eigenthümlichkeiten der Kehlkopfsneubildungen giebt an und für sich eine Contraindication gegen die Operation auf natürlichem Wege ab, sondern erst das Zusammentreffen mehrerer derselben wird uns zur Thyrotomie drängen.

Von andern extralaryngealen Methoden haben wir noch der Spaltung des ligamentum crico-thyreoideum, der Pharyngotomia subhyoidea und der neuen Rossbach'schen sogenannten "subcutanen" Methode* zu gedenken.

Die erstere Operation, die Laryngotomie nach Vicq d'Azyr, ist bekanntlich zuerst von meinem Vater und dann von mir mit Erfolg zur Entfernung von Kehlkopfspolypen ausgeführt worden. Es sind dann noch Mackenzie, Bruns und einige Andere gefolgt; im Ganzen sind, soviel mir bekannt, dreizehn Operationen der Art gemacht. Es ist einleuchtend, dass durch die ausgiebigste Spaltung dieses Ligaments eine immerhin nur kleine Oeffnung geschafft werden kann, dass andrerseits aber die Operation, da das Ligament ganz oberflächlich liegt, ein ganz unbedeutender Eingriff ist. Man kann sich durch dieselbe sehr leicht Zugang zu Tumoren schaffen, die unterhalb der Stimmbänder liegen, aber, wie ich gezeigt habe, kann man auch Tumoren, die am Rande der Stimmbänder, ja selbst solche, die auf der Oberfläche sitzen, gut exstirpiren, so ferne sie nur mit einem genügend langen Stiel versehen sind, und durch den Inspirationsstrom nach unten gezogen werden können. Für solche Fälle ist die Methode sehr zu empfehlen; sie wirkt hier cito, tuto, und gewissermassen auch jucunde, und ich glaube ihr in Zukunft eine grössere Verbreitung prognosticiren zu können.

Endlich die Pharyngotomia subhyoidea ist eine Operation die zwar den Larynx nur indirect eröffnet, oder zugänglich macht, die aber doch schon wiederholentlich zum Zweck der Entfernung der Larynx-Tumoren ausgeführt ist. Die Operation scheint nicht gefährlich zu sein, und ist von keinem Risiko für die Stimmbildung gefolgt. Sie schafft Zugang zu Tumoren der oberen Larynxapertur, und namentlich zu denen der Epiglottis an der oberen, wie auch an der unteren Fläche derselben.

So habe ich bei einer Operation der Art die Stilreste eines wallnussgrossen Sarcoms der Innenfläche der Epiglottis, das ich einige Monate zuvor vom Munde aus mit dem Drahtecraseur entfernt hatte, mit gutem und bleibendem Erfolge zerstört. Ich fand allerdings den Raum bei Weitem nicht so genügend, wie ich es erwartet hatte; das Vorausschicken der Tracheotomie mit Einsetzen der Tamponkanüle halte ich für nothwendig.

Ueber die Rossbach'sche Methode, der bekanntlich vorschlägt ein 22 Mm. langes, starkes Lanzenmesserchen vorn durch die Schildknorpel zu stossen und mittelst desselben unter Leitung des Spiegels im Larynxinneren zu operiren, müssen noch weitere Erfahrungen gesammelt werden, ehe ein Urtheil möglich sein wird. Ich selbst habe die Methode noch nicht ausgeführt.

Bisher sprach ich von Operationen bei Erwachsenen; anders liegt die Sache bei Kindern; die Altersgrenze, bis zu der erfolgreich auf natürlichem Wege Geschwülste bei Kindern entfernt werden können, hat sich in letzter Zeit wesentlich erweitert. Man hat bis zu dem jugendlichen Alter von zwei und

* *Berl. klin. Woch.*, 1880. No. 5.

einem halben Jahre Geschwülste sowohl auf natürlichem Wege, als auch nach Spaltung der Schildknorpel entfernt, aber leider sind, im Ganzen genommen, die Erfolge keine befriedigende. Wir haben es bei Kindern fast ausnahmlos mit Papillomen, und zwar mit multipeln Papillomen zu thun, und in diesem Umstande und den kleinen räumlichen Verhältnissen liegt wohl die Erklärung für die geringen Erfolge. Je jünger die Kinder, desto grösser die Wahrscheinlichkeit auf Papillom, und gerade die ersten drei Lebensjahre disponiren besonders.

Von 40 Kindern, bei denen per os operirt wurde, konnten in 13 Fällen vollständige und dauernde Heilung erzielt werden, 6 Fälle recidivirten und in 7 Fällen blieb die Operation unvollständig.

Auf der anderen Seite 25 Thyrotomien (bei 21 Fällen) mit 8 Heilungen und 9 Recidiven.

Es steht uns die Wahl frei zwischen der endolaryngealen Operation, der Laryngofission, und dem Mittelweg, bei eintretender Dyspnoe zu tracheotomiren, mit der Absicht zu warten, bis bei zunehmendem Alter und Verstand die endolaryngeale Operation möglich wird. Ich selbst habe auf diese Art mit einjähriger Pause bei einem achtjährigen Kinde mit Erhaltung der Singstimme vollkommene Heilung erzielt. Meine Meinung ist nun diese:

Unter allen Umständen versuche man, auch bei Kindern, endolaryngeal vorzugehen, und lasse sich nicht zu schnell durch missglückte Versuche abschrecken, denn man kommt mit Ruhe und Ausdauer bei Kindern viel weiter, wie man Anfangs glauben sollte. Ist auf diesem Wege die Heilung unmöglich, tritt Dyspnoë ein, und ist das Kind so alt, dass man in einigen Jahren auf den zunehmenden Verstand rechnen kann (also 6 bis 8 Jahre) so tracheotomire man und warte ab. Bei ganz kleinen Kindern, bei denen die endolaryngeale Methode unausführbar sich erwiesen hat, wird es misslich sein, das Kind nach ausgeführter Tracheotomie den immerhin doch vorhandenen Gefahren eines Jahre langen Tragens der Kanüle auszusetzen, und hier tritt dann die Laryngotomie in ihr Recht; natürlich mache man aber den Angehörigen und sich selbst die zweifelhafte Prognose der Operation in Bezug auf Recidiv, Functionserhaltung und Lebensgefahr klar.

DISCUSSION.

Professor Krishaber, Paris: Intra-laryngeal operations are easier on the infant than on the adult, as they can be executed without a laryngeal mirror. Last year Professor Verneuil did me the honour to consult me in his clinic of the Hôpital de la Pitié, of Paris, about a child, six years old, in whom the existence of multiple polypi in the cavity of the larynx had been diagnosticated. I at once operated in the following manner: I introduced the index finger of the left hand into the mouth until I touched the epiglottis and drew it upright. I then pushed my finger nearly into the cavity of the larynx, and sliding the forceps along the index finger, I caught hold of the tumours and removed them. The whole operation was executed with extreme rapidity, and yielded an immediate result. The child left the hospital breathing normally.

Dr. Hopmann, Cologne: I agree fully with Professor Burow's proposition that benign neoplasms ought, if possible, to be always removed endo-laryngeally, and I have myself followed this practice whenever I could, but on the other hand, I cannot consider thyrotomy an operation so dangerous to life as it would appear from the statements of the gentlemen who have introduced the subject. Amongst the eight cases of laryngeal tumours which I have treated by laryngofission, there is not a single fatal result which can be directly assigned to the operation itself. The two patients in whom the operation has not had the desired result, died, the one six, the other fourteen, months after the operation,

from the constitutional disease which had led to the operation. A third patient died a long time after the operation, in childbed. The remaining five cases are still alive. The first of these, a clergyman, was operated upon twice (in 1876 and 1877), for what was probably a soft tubercular granulation in the anterior commissure and neighbouring parts. He is now well and able to follow his ecclesiastical duties. In the second case the operation had to be repeated three times. The patient was a child aged four, suffering from multiple papillomata; in the end a permanent cure has been obtained, the operation having been performed in 1876. The third successful operation was made for a lupoid granuloma on a female, aged forty-three, who presented on nose, cheeks, pharynx, and larynx the characteristic signs of lupus. The operation was performed in May, 1878; the cure continues perfect to the present time. The fourth case was that of a workman, aged thirty, suffering from a granuloma on, and beneath, the anterior commissure. Thyrotomy was performed at the beginning of last year, and the patient now speaks clearer than before, no recurrence having occurred to necessitate a new operation. The fifth successful case is that of a female, with formation of a traumatic adhesion between the vocal cords and ankylosis of the left arytenoid cartilage, who was shown, in 1879, to the Medical Society of Cologne, and whose case has been described in Dr. Felix Semon's Paper on Ankylosis of the Crico-Arytenoid Articulation (*Med. Times and Gazette*, vol. ii. 1880). Attempts at improving the whispering voice by excising a part of the membrane through the external opening, in the middle of last year, were only successful in a limited degree The immediate reason why in all cases the operation was performed was, in cases 2 and 3, danger of suffocation; in case 5 the cause stated; in the remaining five, the desire of removing tumours which apparently predisposed to laryngeal tuberculosis, and which were, at any rate, of a suspicious character. It was thus hoped that the possible development of pulmonary phthisis might be prevented. None of the cases showed distinct signs of a deeper affection, but in all catarrh of the apices was present. In a paper to be published shortly I intend to show that during the operations in all cases, facts became apparent which corroborated my anticipations, that in these cases endo-laryngeal procedures would not have led to the desired end. I wish, however, to declare distinctly that amongst many hundreds of cases which could not be regarded otherwise than as tubercular tumours or ulcerative proliferations of the larynx besides these eight cases, scarcely four or five have occurred in which I should have considered the attempt justifiable to prevent, by a very thorough extirpation of the new formation by means of laryngotomy, the development laryngeal or pulmonary phthisis.

Dr. Böcker, Berlin: I wish to direct attention to an incident which may occur when Trendelenburg's canula is used. In a case of mine, in which, after tracheotomy had been performed, this tampon canula was introduced and inflated, the patient suddenly became cyanotic, the pulse irregular, and the respiration impeded. A catheter was introduced through the tube, and the breathing became freer; as soon, however, as the catheter was removed, the former symptoms returned. Now the tube itself was withdrawn, and it became evident that a bulging of the inflated tampon downwards had occurred, which by passing over the lower end of the canula had completely occluded the trachea. As to the question of recurrence of tumours, this happens after laryngo-fission quite as frequently as after the operation *per vias naturales*. speaking of recurrences, in strictness, those cases ought to be excluded in which new tumours form in parts other than those in which the removed new formations have had their seat. I have operated upon a case in which

whole of one vocal cord was surrounded by papillary new formations; laryngo-fission had been advised by some one else. I succeeded in removing the tumours in one week's time. No recurrence ever took place on this vocal cord, but later on excrescences formed on places which had originally been quite free. Had this patient been subjected to laryngotomy, this operation would have had to be repeatedly performed. In the end he was completely and lastingly cured by endo-laryngeal operations. As to the possible consequences of laryngotomy, I would refer to my observations made at the last Congress of German Surgeons, on which occasion I also showed the case referred to by Professor Burow. I will here mention another case in which a patient was operated on extra-laryngeally in a hospital for a fibroma of a vocal cord the size of half a pea. After the patient had been discharged from the hospital, swelling and thickening of the anterior portions of the ventricular bands, and thickening between the anterior parts of the vocal cords, which prevented their approximation, were visible. The patient was entirely aphonic, and it required a galvano-caustic treatment extending over a period of three months to restore to the patient the use of his voice. I am firmly convinced that this patient might have been operated on through the mouth, and been cured within eight days.

Dr. Solis Cohen, Philadelphia: I am afraid that laryngologists sometimes convert innocent papillomas into epithelioma by protracted manipulations continued too long. The indication for extra-laryngeal operations presents itself, in my opinion, as soon as three or four trials under a skilled manipulator fail to procure prompt relief, intra-laryngeally. Fourteen years ago I had occasion to perform two thyrotomies in close succession, and twelve years elapsed before it became necessary to perform another, and then I had to do two at short intervals again. This shows how individual experiences differ, and how wrong it is to draw conclusions entirely from one's own practice. In none of these cases was there any trouble in performing the operations or anything untoward after them, and in none of them was the patient necessarily confined to bed.—I can testify to the value of the digital removal of growths in small larynges, as mentioned by Professor Krishaber. The prolonged retention of a tracheal canula sometimes produces paralysis of the posterior crico-arytenoid muscles, whether from inaction or myo-degeneration, and therefore tends, in some instances, to unnecessarily submit the patient to the permanent use of the canula, when an extra-laryngeal operation might have relieved him from his growth, and thereby of the necessity of the tube. Sub-hyoid pharyngotomy in one case of a child, opened by myself, failed to give sufficient access to the growth.

Mr. Lennox Browne, London: It cannot be too explicitly laid down that the more facile the operator the less frequent will be extra-laryngeal operations. An axiom, therefore, to this effect can be enunciated as the result of this discussion. It should also be clearly understood that whenever an extra-laryngeal operation is decided on, it is useless to compromise with partial division; for at best the space at command is small, and the more thorough the division, the greater will be the amount of success.

Dr. Max Schäffer, Bremen: I have a new fatal case of thyrotomy, which has occurred in my practice, to communicate. In a patient seventy-three years of age, thyrotomy was indicated by the presence of large masses of tumour in the larynx. The operation was begun on account of suddenly occurring dyspnœa, but could not be completed, because severe hæmorrhage set in. I therefore extended the wound downwards, splitting the crico-thyroid ligament, the

cricoid cartilage, and the superior rings of the trachea, so that a high tracheotomy was effected. In spite of the length of the incision, the extirpation of the tumour-masses was very difficult on account of the ossification of the thyroid cartilage, and the removal was not a complete one. The patient progressed favourably for the first three days after the operation, but died on the fifth day, with pulmonary symptoms.

Professor SCHNITZLER, Vienna: I fully agree as to the preference given to intra-laryngeal operations within the limits defined by Professor Burow. I have often had occasion to operate endo-laryngeally on cases of papilloma, in which recurrences had taken place after the performance of extra-laryngeal operations. I fully abide by the dictum that the more dangerous extra-laryngeal operations are only to be adopted after an actual attempt, made by a skilled laryngologist, at proceeding endo-laryngeally has failed.

Dr. FELIX SEMON, London: I beg to state that this question, which seems to most laryngologists to be completely settled, was not intended for the laryngologists proper, but to give the opportunity to the medical public, and to the surgeons especially, to discuss it. This is still necessary. It was—to give but one instance—publicly stated only two years ago, that extra-laryngeal operations had been repeatedly performed on a patient only for the reason that it was really not easy to perform endo-laryngeal ones. Such a moral cannot be condemned strongly enough. The good of the patient is the first thing to be considered; and if it is admitted that, without special training, it is impossible, or at any rate dangerous to the patient, to adopt a method which is undoubtedly the preferable one, then it follows, with absolute logical necessity, that such cases ought to be transferred to those specially trained.—The subject was further chosen to enable gentlemen to substantiate the dangerous and unproven statement that endo-laryngeal interference was frequently productive of a transformation of a benign into a malignant growth; a statement made some time ago in Mr. Lennox Browne's Text-book, and now reiterated by Dr. Solis Cohen. I am now exceedingly surprised to hear from Mr. Browne that he has changed so completely the views concerning this question which he, only three years ago, submitted to the profession in his Text-book.

Professor LEFFERTS, New York: I cannot agree in the extreme view of thi question taken by Dr. Fauvel, but would incline rather to the more temperat opinions expressed by Professor Burow. The extra-laryngeal methods of removin laryngeal growths undoubtedly have an important—an often necessary—plac among the means of operating at our command. I regret, then, to hear th operation so condemned, as it has been done, by some of the speakers, an must offer my personal experience in justification of it. We are all agree that the intra-laryngeal means should be employed in all cases where they ar possible—attempted in all instances; but failing, as they must at times, ther is no other resource open to us. The operation of thyrotomy has not, in m hands, been the dangerous and bloody one represented, and my results hav been good: voice has been restored—no recurrence of the growths. I do n agree that a partial thyrotomy is entirely to be repudiated. On the contrar I regard the preservation of the cricoid cartilage intact as important, and having an important influence on the accurate co-aptation of the wings of tl thyroid after the operation. Upon this accurate co-aptation depends tl result as regards voice. Too often is it neglected. The division of the cric thyroid membrane, in order to reach growths, I have twice seen utterly fa

Finally, I cannot agree with Prof. Burow that in little children a tracheotomy should first be done, and the surgeon then wait for some years before performing any operation, by the natural passages, for the removal of the growths. Regarding the first opening of the air passages, the tracheotomy, as the dangerous operation, I should rather follow it up at once by a thyrotomy—complete the operation—than by waiting as advised, expose the child to an opportunity for the growths to increase, with the dangers attendant upon such a development.

Dr. C. Fauvel, Paris: It results from our discussion that the removal of laryngeal polypi must remain the domain of the specialist, and that we are unanimous in rejecting, as long as possible, extra-laryngeal operations. I cannot do better in this respect than accept Dr. Felix Semon's conclusions. It is to be hoped that even surgeons who do not devote themselves especially to the subject will see the force of the arguments in favour of the intra-laryngeal method.

Prof. Burow, Königsberg: I should have mentioned Prof. Voltolini's sponge operations. I would further ask why Dr. Hopmann did not remove the excrescences in laryngeal tuberculosis through the mouth, as, according to his own statement, they were soft. I confess that Dr. Hopmann's cases do not seem to me to offer an urgent indication for thyrotomy. With regard to Dr. Böcker's remarks on the use of Trendelenburg's tampon-canula, I would urge that the tampon should be doubly and very firmly tied to a piece of drainage tube inserted between it and the canula, and that it should be inflated only after narcosis has been fully established.

Sur les effets du traitement mécanique des sténoses laryngiennes.

Dr. Koch, Luxemburg.

Les rétrécissements laryngiens peuvent surgir subitement, ou bien leur début et leur parcours sont plus ou moins chroniques. C'est surtout dans l'intention de combattre ces derniers que l'on a préconisé et employé avec plus ou moins de succès le traitement mécanique.

Les sténoses aiguës s'offrent à nos yeux le plus souvent comme symptôme prédominant de quelques affections aiguës de l'enfance; ce sont surtout la diphthérie et le croup, moins souvent l'œdème, les abcès, les paralysies aiguës de la glotte qui en sont la cause; plus rarement elles se présentent comme complication de certaines maladies générales chez les adultes. C'est contre ces espèces de rétrécissements aiguës que Loiseau a préconisé le premier le cathétérisme laryngien. Desault, en le pratiquant d'abord malgré lui, en avait démontré la possibilité. Après Desault, un certain nombre de chirurgiens ont pratiqué le cathétérisme avec un succès plus ou moins douteux; et si l'on en avait prouvé la possibilité, on en avait démontré en même temps la difficulté, l'insuffisance et même le danger. Plus tard Bouchut étendit l'emploi de la sonde laryngienne en ce sens qu'il conseillait à la laisser en demeure et à la rendre inamovible en fixant son extrémité antérieure. C'était par ce "tubage de la glotte" que l'on voulait éviter la trachéotomie sous prétexte que cette dernière était plus dangereuse, plus difficile et plus cruelle. Déjà après les premières expériences malheureuses ce tubage de la glotte fut caractérisé par Trousseau comme "une opération très-belle en théorie, mais difficile et à condamner en pratique;"

c'était à l'occasion de l'enquête qui eut lieu quand les sept premiers enfants soumis au tubage de la glotte avaient succombé.

Nous savons tous que le tubage n'est pas une opération si facile ; la sonde une fois bien introduite, il nous est presque impossible de la fixer convenablement par son extrémité antérieure ; des plaies et du décubitus de la muqueuse malade sont les suites presque inévitables de cette opération ; en cas de diphthérie ces nouvelles plaies deviennent couenneuses elles-mêmes ; la sonde laryngienne s'obstrue très-facilement, et un simple mandrin ne suffit pas pour la rendre perméable à l'air respiratoire ; pour la nettoyer il faut la sortir et répéter ainsi un certain nombre de fois une opération laborieuse et cruelle, répétition à laquelle les petits malades et l'entourage ne se soumettront que très difficilement. Les simples cathéters anglais employés autrefois sont trop facilement rongés par les dents aiguës des enfants ; Weinlechner de Vienne les remplaça par les tubes en caoutchouc vulcanisé, et par précaution, il mettait un coin dans l'angle de la mâchoire inférieure du malade.* Depuis les chirurgiens ont construit un certain nombre de tubes laryngiens, parmi lesquels nous ne voulons citer que celui de Labus de Milan comme le meilleur. J'aurais bien voulu voir le cathétérisme pratiqué des temps d'Hippocrate et de Paul d'Egine, alors qu'aujourd'hui avec nos connaissances anatomiques parfaites, le miroir laryngien comme guide à la main, il nous faut encore avoir acquis une certaine adresse pour le pratiquer tant soit peu convenablement. L'enfant, forcé déjà à lutter contre une dyspnée suffocante, se debat moyennant le reste de ses forces musculaires pour s'opposer à cette opération assez barbare ; ce dernier reste de forces musculaires dépensées, le petit malade ne pourra plus faire les efforts si nécessaires pour respirer et pour expectorer les fausses membranes. De plus, pour pratiquer le tubage, le médecin a besoin d'une assistance au moins aussi instruite qu'il la faut pour pratiquer la trachéotomie. Sceparowskij a vu deux fois survenir une mort subite parsuite de la poltronnerie bien explicable des enfants et de l'inadvertance de l'entourage.† Quand le larynx et la trachée sont revêtus de fausses membranes, il n'arrive que trop facilement que le tube les pousse devant soi jusqu'à la bifurcation, endroit où elles constituent alors une nouvelle entrave à la respiration ; les forces de l'enfant à moitié asphyxié ne suffisent pas pour expectorer ces conglomérats de membranes, la trachéotomie vient trop tard et la mort est inévitable.‡ Dans la littérature nous trouvons deux exemples de croup où cet accident fâcheux est arrivé. Avant le cathétérisme la dyspnée était exclusivement laryngienne ; après l'opération la dyspnée prit subitement un caractère tout-à-fait différent ; l'air passait facilement par le larynx et la trachée, les mouvements respiratoires étaient normaux aux points supérieurs du thorax, tandis qu'à la plus grande partie inférieure de ce dernier on observait le type respiratoire inverse ; la mort survint sans que la dyspnée laryngienne ne se soit déclarée de nouveau. Plus encore : dans la majeure partie des cas le cathétérisme et le tubage pratiqués selon les règles de l'art se sont montrés insuffisants, il fallait avoir recours à la trachéotomie consécutive ; naturellement les manipulations antérieures et l'état d'asphyxie avancé diminuaient les chances de réussite de cette dernière opération.

Si, d'un autre côté, nous considérons que la trachéotomie faite sur l'enfant est une simple opération qui avec moins de douleur et moins de danger remplit exactement le même but que le tubage, que la pratique de ce dernier est une opération assez difficile qui d'après le conseil de Hack de Fribourg ne devrait

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* Weinlechner, *Jahrbuch für Kinderheilkunde*, 1876. 4 Jahrgang. Heft i. S. 69.
† *Centralblatt fur Chirurgie*, No. 26.
‡ Observations du Dr. Hüttenbrenner de Vienne.

jamais se faire sans l'emploi du laryngoscope;* si nous pensons que la répétition souvent nécessaire du tubage est une cruauté, tandis que le nettoyage et même le changement d'une canule trachéale ne sont qu'un jeu; si, de plus, nous songeons que le traitement local exigé par l'affection primitive se fait plus facilement et avec plus de succès par une ouverture trachéale que par la bouche, on conviendra certainement que dans tous les cas sans exception aucune il faut préférer la trachéotomie au cathétérisme et au tubage.

Les sténoses laryngiennes chroniques sont ordinairement occasionnées par des retractions cicatricielles, par l'élimination, le déplacement ou l'hyperchondrose des cartilages du larynx, plus rarement par des épanchements sanguins et séreux ou par des foyers purulents d'ancienne date. Le traitement mécanique dans ces cas a pour but d'augmenter le calibre de la glotte à un degré tel que la trachéotomie puisse être évitée complètement ou que le malade puisse se passer de la canule quand cette dernière opération a dû être pratiquée antérieurement. Ce traitement a été préconisé et mis en usage par Schrötter, qui le pratique suivant la méthode connue des bouleaux en zinc et des sondes en caoutchouc durci; les différents dilatateurs imaginés par les auteurs, tels que ceux de Navratil, de Dupuis, de Labus, de Mackenzie, les bouleaux en ivoire de Paul Bruns, l'olive en ivoire de Rose servent au même but. Les statistiques ainsi que l'expérience journalière nous démontrent que cette méthode d'élargir les premières voies met à l'épreuve le bon vouloir du malade et la patience du médecin; elle n'est pas innocente; pratiqueé par les mains les plus habiles et avec le plus grand ménagement possible, elle n'est que trop souvent suivie de douleur, d'inflammation, de fièvre, d'abcès; la durée du traitement prend des mois et même des années; après cette époque on n'a atteint ordinairement qu'une amélioration, les guérisons réelles sont rares, les récidives sont à l'ordre du jour. C'est le résultat final auquel Mackenzie, Paul Bruns, E. Burow et Ganghofner sont parvenus depuis longtemps et auquel les statistiques nous mènent. Les exemples que j'ai observé m'ont conduit aux mêmes conclusions. Les statistiques générales vous seront soumises tout à l'heure, je veux seulement citer quelques exemples à l'appui. Le premier concerne un ancien cocher parisien, âgé de 45 ans, affecté d'un chancre dur en 1864, lequel n'a été traité que localement; en 1872 les premiers symptômes laryngiens consistant en aphonie et légère dyspnée se déclarèrent; l'amélioration survint sans traitement; plus tard l'aphonie et une plus grande dyspnée se déclarèrent de nouveau; cette dernière atteignit un degré inquiétant aux grands mouvements. En ce moment le malade montre les glandes cervicales engorgées et des cicatrices rétrécissant le calibre du larynx; le traitement mécanique longtemps prolongé restait sans effet. Le malade prit de grandes doses d'iodure de potassium et la trachéotomie put être évitée. Ainsi malgré la date reculée de l'infection syphilitique il existait encore quelque engorgement, soit de la muqueuse soit du périchondre, affection qui cèda á l'iodure de potassium.

Le second cas concerne un garçon âgé de 18 ans, qui pendant une fièvre typhoïde très-intense fut atteint d'un laryngotyphus; après la guérison de la maladie générale les cordes vocales se touchèrent par leur tiers antérieur, et par leurs deux-tiers postérieurs ils formaient les deux côtés d'un triangle isoscèle dont la base mesurait à peine quelques millimètres, triangle qui représentait la glotte. Le traitement par les bouleaux en zinc était resté sans effet; l'introduction facile des plus gros bouleaux était en contradiction avec la dyspnée qui survint chaque fois que l'on bouchait la canule et fit admettre l'ankylose des deux articulations crico-aryténoïdiennes contre laquelle le traitement mécanique restait nécessairement sans effet. Le malade portait la

* Volkmann's "Klinische Vorträge," Band ii., Chirurgie.

canule pendant trois ans, époque pendant laquelle le traitement mécanique fut repété de temps en temps. Enfin, en 1880, ainsi quatre ans après l'invasion du laryngotyphus, un abcès se forma au dessous de l'ouverture trachéale et s'ouvrit en laissant écouler une grande quantité de pus sans grumeaux cartilagineux; le malade, de son propre chef, avait ôté la canule et ne s'est présenté qu'après la guérison de l'abcès et après que l'ouverture trachéale était fermée. La respiration s'effectue normalement par les voies naturelles, la voix est celle d'une basse profonde, les cordes vocales sont d'une teinte rosâtre, le cartilage de Santorini droit a disparu, les excursions des aryténoïdes sont réduites à la moitié de leur grandeur normale. Ainsi cette guérison spontanée, pour ainsi dire, peut avoir été hâtée dans sa marche par le traitement mécanique, mais nous sommes loin de vouloir prétendre que ce dernier a guéri le malade. Ce fait nous apprend qu'après une marche lente et insinuante ces périlaryngites typhoïdes et avec elles les rétrécissements laryngiens peuvent marcher vers la guérison après des années encore et qu'il n'est pas permis d'entreprendre une opération radicale avant que la terminaison de ces affections si lentes ne soit un fait accompli.

Un troisième cas de rétrécissement laryngien chronique concerne un robuste garçon, âgé de 19 ans, atteint d'un laryngotyphus. La trachéotomie n'avait pas été pratiquée par négligence de la part de l'entourage; néanmoins le malade se tira d'affaire après avoir expectoré de grandes quantités de pus et de sang. Quelques semaines après le malade était guéri en ce sens que la voie était voilée et que la dyspnée combinée au cornage se faisait sentir aux grands mouvements. L'examen laryngoscopique fit voir les cordes vocales légèrement rougies, un mouvement incomplet de la corde vocale gauche au moment de la phonation, un écartement incomplet du deux cordes vocales pendant une inspiration profonde. Impossible d'apercevoir des cicatrices. Il fallait diagnostiquer une myopathie des deux muscles crico-aryténoïdiens postérieurs, du crico-aryténoïdien latéral gauche et du muscle inter-aryténoïdien. Naturellement le traitement mécanique restait sans effet. On avait tort de ne pas pratiquer la trachéotomie à l'apogée de la maladie; mais le traitement mécanique ne peut rien faire contre les myopathies quand même ces dernières sont de nature cicatricielle.

Un quartième exemple nous est représenté par un robuste campagnard, âgé de 22 ans. Atteint d'une fièvre typhoïde intense les symptômes d'un laryngotyphus survinrent la septième semaine de l'affection générale; la trachéotomie devint inévitable. Quinze jours après cette opération le miroir laryngien fit voir l'épiglotte tuméfiée et injectée; au dessous de cette dernière on n'apercevoit qu'un cône dont la base correspondait à l'entrée de la glotte et dont le sommet se trouvait au niveau du cricoïde; on ne pouvait pas distinguer les cordes vocales. La muqueuse laryngienne était d'un rouge foncé et d'une sensibilité extrême. En bouchant la canule on provoquait un accès de suffocation. Sans aucun doute le procès morbide n'était pas fini, mais en vue de changements pathologiques aussi développés nous nous attendions à un rétrécissement laryngien consécutif énorme. La canule fut laissée à demeure et l'affection fut abandonnée à son cours naturel, sauf à faire plus tard un essai par le traitement mécanique. Le malade refusa le traitement, prétendant que son état s'améliorait de jour en jour. Il avait raison: trois ans après l'opération de la trachéotomie la canule a pu être ôtée définitivement, la respiration s'effectuait normalement par les voies naturelles, la voix était à peine voilée; le laryngoscope fit voir l'image laryngienne correspondante à un simple catarrhe chronique sans cicatrices. Si nous avions employé le cathétérisme nous lui aurions attribué à tort un succès qui ne lui revenait pas. Cet exemple nous prouve donc encore une fois la marche lente des périlaryngites des périchondrites et des ulcérations chroniques, et montre la possibilité de leur guérison finale spontanée et tardive

Dans les hôpitaux et dans les cliniques particulières des grandes villes il est rare de pouvoir suivre les sténoses laryngiennes depuis leur début jusqu'à leur dénouement; c'est pourquoi j'ai tenu á observer ces exemples à partir de leurs premiers symptômes alarmants jusquà leur guérison spontanée relative. Sans ce contrôle continu et sévère on n'aurait été que trop porté à admettre l'efficacité du traitement mécanique.

Si d'un côté on a revendiqué au traitement mécanique des effets salutaires que ne lui reviennent pas, il n'est pas à nier d'un autre côté qu'il a eu des succès bien mérités; il s'agit seulement de limiter ces derniers consciencieusement. C'est notamment en cas d'œdème chronique avec ou sans périchondrite, en cas d'épanchement sanguin sousmuqueux, d'hypertrophie partielle de la muqueuse laryngienne, en cas d'adhérences partielles des cordes vocales, en cas de simples cicatrices transversales que son emploi est indiqué. Mais dès qu'il y a le moindre danger en demeure c'est de notre devoir de pratiquer la trachéotomie prophylactique; c'est une petite opération qui conjure de grands dangers. Quand de cette façon la respiration est garantie, on peut attendre tranquillement la fin de la maladie; un traitement local et notamment le traitement mécanique peuvent être essayés, leur pratique est d'autant plus facile; mais la canule trachéale doit rester en demeure jusqu'à la guérison la plus complète. Nous trouvons dans la littérature des faits déplorables qui nous engagent à observer cette règle sans exception aucune; je citerai quelques exemples survenus tous dans la même clinique viennoise: sur un jeune homme âgé de 20 ans on avait dû pratiquer la trachéotomie à cause d'une chorditis vocalis inferior hypertrophica; à la suite du traitement mécanique on le croyait guéri; mais le malade étouffa deux mois plus tard. Une servante âgée de 16 ans fut traitée moyennant le cathétérisme sans trachéotomie préalable; pendant la nuit il survint un accès de suffocation, la malade étouffa, la trachéotomie vint trop tard; il s'agissait d'une simple périchondrite laryngienne contre laquelle la trachéotomie aurait été le spécifique. Le même accident fâcheux s'est produit sur une servante âgée de 22 ans. Pendant le cours du traitement mécanique institué pour une simple affection syphilitique du larynx, un cordonnier, âgé de 20 ans, étouffa de la même façon sans que la trachéotomie n'avait été faite; nous voyons donc que le raisonnement aussi bien que les statistiques nous prouvent qu'il existe un bon nombre de sténoses laryngiennes où le simple cathétérisme ne saurait jamais remplacer la trachéotomie; et si quelques succès temporaires semblent contredire à cette règle, ces succès ne doivent pas nous rendre aveugles vis à vis du nombre relativement grand de catastrophes fâcheuses qui plaident en sa faveur.

Si la trachéotomie a été pratiquée préalablement, si de plus nous sommes convaincus de l'insuffisance du traitement mécanique, il faut avoir recours à la laryngotomie qui a souvent ses avantages non douteux. Cette dernière opération rentre dans ses droits quand il y a déplacement des cartilages laryngiens, suite de fracture, de blessures par armes à feu, de tentatives de suicide, surtout si dans ce dernier cas le rasoir avait séparé complètement les cartilages thyroïde et cricoïde. Si Billroth a prouvé que les deux bouts d'un cartilage costal fracturé se réunissent moyennant un cal osseux, si Schottelius a démontré qu'après l'âge de la puberté il se forme normalement dans les cartilages laryngiens des foyers vascularisés suivis de formations osseuses, la formation de grands cals osseux dans des larynx fracturés n'a rien de surprenant (Max Schüller); il n'y a pas à penser à un traitement mécanique dans les cas d'hyperchondrose, surtout si nous voyons que dans ces mêmes cas la simple laryngofissure est très-difficile et que nous possédons des exemples où après la pratique laborieuse de la laryngofissure le chirurgien, n'ayant pu écarter le deux moitiés laryngiennes malgré les plus grand efforts, a dû recourir a la résection partielle

de la paroi laryngienne antérieure. Cette résection partielle avec conservation du périchondre a été pratiquée pour la première fois par Heine. Immédiatement après cette résection on place une simple canule laryngienne ou mieux encore une canule en T, en attendant la guérison de la plaie. La possibilité de la perte de la voix n'est pas une objection sérieuse contre l'indication de la laryngotomie et de la résection laryngienne : la voix est le plus souvent détruite par l'affection primitive et le malade pourra porter un larynx artificiel. Dans les cas rares où la voix n'était pas perdue primitivement, les cordes vocales peuvent ordinairement être ménagées et quand après un certain temps la consolidation du larynx s'est opérée, le malade pourra se passer de la canule et du larynx artificiel.

Conclusions.—1.—Le cathétérisme et le tubage de la glotte sont à rejeter en cas de sténoses laryngiennes aiguës dès que ces dernières menacent la vie ; le cathétérisme et le tubage ne peuvent, sous aucune condition, remplacer la trachéotomie.

2.—Quand il s'agit de sténoses laryngiennes chroniques on examinera d'abord si le procés morbide est arrivé à sa fin ; si non, il faut instituer le traitement général correspondant, et attendre que l'affection laryngienne ait atteint son dénoûment final.

3.—Dans les cas de rétrécissements chroniques le traitement mécanique peut être employé de primabord ; mais dès qu'il existe le moindre péril en demeure, il faut faire la trachéotomie préventive.

4.—Il faut pratiquer chaque fois la trachéotomie profonde.

5.—Quand la respiration est ainsi garantie ou par les voies naturelles ou par l'ouverture artificielle, on peut faire emploi du traitement mécanique, soit par les voies normales, soit par l'ouverture trachéale.

6.—Quand dans ces cas le traitement mécanique fait défaut, il faut avoir recours à la laryngotomie suivie de d'excision, de cautérisations, &c. &c.

7.—Quand la laryngotomie avec son traitement consécutif ne suffisent pas à elle seule, il faut la faire suivre par la résection partielle, par l'introduction d'une canule en T, et éventuellement d'un larynx artificiel.

Die Resultate der mechanischen Behandlung der Kehlkopfstenosen.

Dr. T. Hering, Warschau.

Die bisher nicht genügend präcisirten und zum Theil widersprechenden Ansichten über den Werth der mechanischen Behandlungen der Larynxstenosen, veranlassten unser hochverehrtes Präsidium, dieses Thema in das Programm der zu discutirenden Fragen aufzunehmen und dadurch Klärung und Verständniss der fraglichen Punkte zu bewirken.

Die Larynxstenose bildet unstreitig einen der qualvollsten Zustände, sowohl für den Kranken, wie für seine Umgebung. Auch der Arzt war noch his vor Kurzem dem Leiden gegenüber machtlos und nach bald erschöpften therapeutischen Versuchen, trat die Tracheotomie in ihre Rechte. Wohl beseitigte sie den drohenden Erstickungstod, aber sie schuf neue Gefahren und blieb, da gewöhnlich die Stimme verloren oder unverständlich war, ein palliatives, einen elenden Zustand verlängerndes Mittel. Der Kranke war verdammt das ganze Leben die Canüle zu tragen, und war von der Welt durch den peinlichen Eindruck den er weckte, wie abgeschlossen.

Bevor ich der Versuche, die Canüle entbehrlich zu machen, erwähne, möchte ich einige Worte der Eintheilung der Stenosen und ihren Ursachen widmen.

Die Kehlkopfstenose bildet vom pathologischem Standpunkte aus keine

selbstständige Krankheitsform, sondern nur einen durch verschiedene Processe bedingten Zustand. Wir unterscheiden im Allgemeinen acute und chronisch verlaufende Formen. Die acuten Larynxstenosen werden meistentheils durch entzündliche Processe als da sind: Croup, Diphtheritis, acute Perichondritis, chemische und mechanische Läsionen bedingt. Die chronischen Formen sind das Resultat von hypertrophischer Entzündung der Schleimhaut, des submucösen Gewebes, oder des Perichondriums. Narben und Verwachsungen, als Residuen ulcerativer Processe, wie solche im Verlaufe der Variola, des Typhus, der Syphilis gesetzt werden, sind die häufigsten Ursachen der Verengerung.

Von allen Einzelheiten dieser Processe absehend, da sie Ihnen, meine Herren, ja allen gut bekannt sind, werde ich mich bemühen, die Resultate einer Statistik von 100, von mir gesammelten Fällen mitzutheilen und je nach der in Anwendung gezogenen Behandlung von einander zu scheiden.

Die Schwierigkeiten einer solchen Zusammenstellung waren grösser als ich es anfänglich vermuthete, weil die bisher publicirte Casuistik keine vollständige Garantie bietet, ob die als geheilt angegebenen Fälle, sich als solche bisher bewährt haben, ferner da die Diagnose nicht immer präcise gestellt werden konnte, besonders aber die Anamnese nicht genügend in allen Fällen berücksichtigt worden war. Ich war also angewiesen, um ein möglichst sicheres Material zu sammeln, mich an die Herren Collegen, welche auf diesem Felde gearbeitet hatten, zu adressiren und um Angabe über den weiteren Verlauf zu bitten.

Der Liebenswürdigkeit vieler dieser Herren verdanke ich nicht nur genaue Angaben über den weiteren Verlauf, sondern auch eine Bereicherung der Casuistik, durch bisher noch nicht publicirte Beobachtungen und ich ergreife die Gelegenheit ihnen hiermit meinen verbindlichsten Dank auszusprechen. Arbeiten, welche ohne Angabe der Casuistik publicirt worden sind, konnte ich nur in Kürze berücksichtigen, da sie kein brauchbares Material zur Statistik bieten. Um eine leichte Orientirung in dem angehäuften Material zu erlangen, ist die Casuistik in Tabellen, deren Rubriken die wichtigsten Punkte jeder Beobachtung enthalten, aufgenommen worden.* Von der Beschreibung jedweder Methoden werde ich ganz absehen, den Catheterismus beim Croup nur flüchtig berühren und in möglichster Kürze meine Schlussfolgerungen zu präcisiren versuchen. Obwohl der grösste Theil der Casuistik den Originalarbeiten entnommen wurde und nur einige Beobachtungen aus Referaten stammen, sind mir die Mängel dieser Statistik wohl bekannt. Von Ihnen, meine Herren, hängt es ab zu ihrer Vervollkomnung beizutragen und wird jede Angabe über unberücksichtigt gelassene Beobachtungen, oder etwaige Ungenauigkeiten in der Bearbeitung des Materials, mit grossem Danke angenommen werden.

Bei der mechanischen Behandlung der Larynxstenosen sind zwei Methoden zu unterscheiden:

1) Einführen in den Larynx von Hohlröhren vor der Tracheotomie;
2) Methodische Dilatation nach bereits ausgeführter Tracheotomie.

Erste Methode.

(*Vor der Tracheotomie.*)

Die ersten Versuche durch Einführung von Röhren der Larynxstenose vorzubeugen und dadurch die Tracheotomie zu umgehen, stammen von Desault. Bei Croup wurde der Catheterismus von Bouchut in sieben Fällen angewandt, doch immer mit lethalem Ausgang. Trousseau, welcher von Seiten der franzö-

* Die Tabellen werden von dem Autor in den *Archives of Laryngology* veröffentlicht werden. Die Verweise auf dieselben sind beibehaltenword en, um spätere Vergleiche zu erleichtern. Anm. der Herausgeber.

sischen Akademie zum Referenten einer Commission zur Prüfung dieser Methode berufen war, konnte sie nicht empfehlen und betonte unter anderen Gründen das experimentell nachgewiesene Zustandekommen von Decubitus-Geschwüren, welche durch Druck der Röhren erzeugt wurden. Auch der Vorschlag Weinlechners, der im Jahre 1871 das Einführen von Röhren aus Hartgummi als symptomatisches Heilmittel bei Croup und Diphtheritis empfahl, fand wenig Beobachtung. Es sind von Hüttenbrenner, Rauchfuss und Hack begründete Bedenken gegen diese Procedur erhoben worden, während Monti den Catheterismus zwar bei Croup verwarf, ihm dagegen bei asphyctischen Zuständen als symptomatischem Mittel Geltung zu schaffen versuchte. War auch die Idee von Weinlechner im Allgemeinen von den Aerzten nicht acceptirt worden, so muss es ihm dennoch als Verdienst angesehen werden, den Catheterismus zur methodischen Behandlung der Larynxstenosen vorgeschlagen und ausgeführt zu haben.

Erst Schrötter war es vorbehalten, diese Methode weiter auszubilden und durch stricte Beobachtungen und Versuche ihr das Bürgerrecht zu verschaffen. Statt der elastischen Bougies oder Catheter sind von Schrötter dreieckige, dem Larynxinnern entsprechend geformte und gebogene Hartgummiröhren von verschiedener Dicke zur Dilatation angewandt und der Grundstein einer Heilmethode, die mit vollem Rechte den Namen ihres Begründers trägt, gelegt worden.

A. *Der Catheterismus laryngis als lebensrettende Operation bei acut auftretenden Larynxstenosen.*

Dieses Verfahren hat sich bei acuten Stenosen sogar als lebensrettende Operation erwiesen, die in einigen Fällen die Tracheotomie gänzlich ersetzen konnte, während in anderen Fällen Zeit zur Vorbereitung für die Tracheotomie gewonnen wurde.

Hierher gehören die Beobachtungen von Labus, Hack, Mac Even, O. Chiari und Szeparowicz.

Der Catheterismus wurde vorgeschlagen aber so viel mir bekannt, nicht angewendet bei:

1) Blutergüssen in das submucöse Gewebe, in Folge von Verletzungen oder Fracturen der Kehlkopfknorpel (Schrötter).

2) Bei Laryngospasmus (Hack).

Er wurde bisher angewandt bei folgenden durch Larynxödem bedingten, mit drohenden Suffocationsanfällen einhergehenden Zuständen:

Phthisis laryngea	2
Acutes Larynxœdem	2
Perichondritis mit Oedem	1
Posticus-Lähmung	1
Laryngitis hyperplastica	1
Syphilitische Stenose	1
	8

Die Tubage ist im Allgemeinen indicirt bei allen acut auftretenden Stenosen, welche, sei es durch Oedem, sei es durch Lähmung der Glottiserweiterer entstanden, zu lebensgefährlichen Erstickungsanfällen Veranlassung geben. Sie kann in Ermanglung von Schrötter'schen Röhren mittelst eines elastischen Catheters (Labus) oder einer Schlundbougie (Szeparowicz) mit Erfolg ausgeführt werden. Obwohl principiell das Einführen von Instrumenten in den Larynx unter Beihülfe des Spiegels ausgeführt werden soll, kann und muss in gewissen Fällen das Rohr unter Leitung des Fingers eingeführt werden.

Die speciellen Angaben über die Resultate dieser Methode sind in der

Tabelle I., N. 1—7 (und T. VII., N. 37) aufgenommen worden. Wir ersehen aus derselben, dass die günstigen Resultate

2 Mal bei acutem Larynxödem (N. 3, 4)
1 Mal bei luetischer Stenose (N. 2)
1 Mal bei Posticus-Lähmung (N. 37, T. VII.)

erzielt worden sind, d. h., die Tracheotomie ersetzt hatten. Die Tracheotomie wurde aufgeschoben:

2 Mal bei Phthisis laryngea (N. 1, 6)
1 Mal bei Perichondritis (N. 5).

Verschlimmerung des Zustandes (subcutanes Emphysem) ist in einem Falle (No. 7) von Szeparowicz bei einem 1½ jährigen Kinde beobachtet worden. Die Schrötter'schen Röhren, resp. Catheter, wurden entweder kürzere Zeit von 5 Minuten bis 1 Stunde, oder à demeure, bis zu 8 Tagen, ohne Unterbrechung im Larynx gelassen (No. 37).

Eine Durchsicht der vorliegenden Fälle, führt uns zu folgenden Schlüssen über den Werth des Catheterismus bei acut auftretenden gefahrdrohenden Stenosen:

1) Der Catheterismus kann die Tracheotomie in gewissen Fällen ersetzen, ist aber bei kleinen Kindern mit grösster Vorsicht und nur in der dringendsten Noth auszuführen.

2) Das Einführen und längere Liegenlassen im Larynx von Hohlbougies (à demeure) kann zu Decubitusgeschwüren, sogar zur Blosslegung der Knorpel Veranlassung geben und ist bei kachektischen Zuständen direct als schädlich zu bezeichnen (No. 33, 35, 39).

3) Diese Behandlungsweise darf nicht ambulatorisch ausgeführt werden; sie fordert grosse Vorsicht und stetige Ueberwachung des Kranken von Seiten des Arztes, da nach unvorsichtiger Entfernung der Röhren tödtliche Erstickungsanfälle vorgekommen sind (No. 36).

4) Beim forcirten Catheterismus (bei Erwachsenen) sind alle Vorbereitungen zur Tracheotomie zu treffen, die Versuche mit dünnen Röhren und nicht zu lange vorzunehmen, und falls keine Besserung eingetreten ist, die Tracheotomie auszuführen.

5) Bei tuberculöser Phthise und bei Carcinoma laryngis ist die Tracheotomie der Tubage vorzuziehen (No. 29, 30).

B. Der Catheterismus laryngis behufs der graduellen Erweiterung von chronischen Larynxstenosen und seine Resultate.

Diese Behandlungsweise wurde mittelst Catheter, Schlundbougies, vorwiegend aber mit den von Schrötter angegebenen Hartgummiröhren ausgeführt. Eine Reihe von 47 Beobachtungen ist in den letzten Jahren publicirt worden und in den Tabellen 2 bis 9 (No. 8—54) enthalten. Diese Art der Behandlung wurde angewandt bei:

Chorditis hypertrophica	12
Blenorrhœa Stœrkii	8
Perichondritis chronica	8
Stenosis ex lue	6
Narbige Strictur (?)	4
Posticus-Lähmung	3
Stenosis ex hyperplasia membranæ mucosæ	2
Perichondritis tuberculosa	1
Lupus laryngis	1
Epithelialcarcinom	1
Abscessus laryngis	1
	47

In Anbetracht der Natur des Leidens, welches sich in Störungen der Respiration und des Sprachvermögens manifestirt, ist unter Heilung die Erweiterung der Glottis bis zur Norm und dem Verschwinden der stenotischen Erscheinungen, sogar bei forcirter Körperbewegung, zu verstehen.

Als vollständig geheilt betrachte ich diejenigen Fälle, wo, ausser der frei gewordenen Respiration auch die Stimme in Bezug auf Stärke und Klang ihren normalen, oder nahezu normalen Charakter wiedererlangt hatte.

Als gebessert sind diejenigen Fälle zu betrachten, in welchen bei forcirter Bewegung sich leichte Dyspnoe einstellte, und die Stimme laut, wenn auch etwas unrein blieb.

Die Tabelle A. ergiebt folgende Resultate:

Respiration und Stimme normal . . .	12	Fälle
Respiration normal, Stimme unrein .	15	„
Respiration gebessert, Stimme unrein .	11	„
Resultat unbekannt	3	„
Negatives Resultat	6	„
	47	Fälle

Sie ersehen, meine Herren, aus dieser Zusammenstellung, dass auf 47 Fälle von hochgradiger Larynxstenose in 27 Fällen die normale Respiration wieder erlangt wurde,—wahrlich ein schönes beherzigenswerthes Resultat.

Und nun, meine Herren, le revers de la médaille!

Unter den sechs mitgetheilten mit negativem Resultate behandelten Fällen findet sich fünf Mal lethales Ende verzeichnet.

Diese fünf Todesfälle verlangen eine nähere Betrachtung, da gerade die Misserfolge am meisten belehrend sind, und uns vor Fehlgriffen in der Zukunft schützen. (Hierher gehören die Beobachtungen Nr. 33, 34, 35, 36 und 39 [Tafel 6 und 7].)

Wir finden Exitus lethalis bei

Perichondritis acuta	2 Mal
Perichondritis chronica	2 Mal
Posticus-Lähmung	1 Mal

Der Tod war in einem Falle (Nr. 36) verschuldet durch Entfernung der Röhre aus dem Larynx seitens des Patienten, die à demeure belassen war; in einem Falle (Nr. 33) entstand, nach zu schnellem Dilatiren in einer Sitzung, starke Dyspnoe, und in der Nacht Tod in Folge von Lungenödem.

In drei Fällen erlagen die Patienten ihrem Leiden, welches nur einmal durch Recidiv der Stenose bedingt wurde; in den übrigen zwei Fällen als Myelitis und Pneumonie bezeichnet ist. Aus dem bisher Angeführten können folgende Schlusssätze formulirt werden:

1) Die besten Resultate sind von dieser Methode bei der sogenannten Chorditis vocalis hypertrophica inferior erzielt worden (8 Fälle).

2) Das zu schnelle Vorgehen bei der Dilatation ist absolut zu meiden, und als schädlich zu bezeichnen.

Zweite Methode.

Mechanische Dilatation der Larynxstenosen nach ausgeführter Tracheotomie.

Der erste, der das Einführen solider Metallbougies von conischer Form und allmälig steigender Dicke vom Munde aus versuchte und in einem Falle practisch verwerthete, war Trendelenburg. Unabhängig von ihm hat Schrötter seine Versuche, mittelst dreieckiger Zinnbolzen die Stenose von Oben zu dilatiren, an einer gewissen Anzahl von Kranken verfolgt, das Verfahren weiter

ausgebildet, entsprechende Instrumente angegeben, und seine Erfahrungen in der bekannten Brochüre: "Beitrag zur Behandlung der Larynxstenosen" niedergelegt.

Vier verschiedene Behandlungsmethoden sind zur Hebung der Stenosen nach ausgeführter Tracheotomie bisher in Anwendung gezogen worden.

a) Mechanische Dilatation nach der Laryngotomie (Spaltung des Kehlkopfs) durch Einlegen von Zinnstäbchen oder entsprechenden Canülen, von dem Munde aus.

b) Dilatation durch die Trachealfistel mit verschiedenen Instrumenten.

c) Dilatation von Oben, durch den Mund (Schrötter's Methode).

d) Laryngotomie, partielle Kehlkopfresection.

A. *Methodische Dilatation nach Spaltung des Kehlkopfes durch Einlegen von Zinnstäbchen oder entsprechender Canülen, von der Wunde aus.*

Versuche dieser Art sind von Trendelenburg mit relativ günstigem Resultate versucht worden; doch konnte die Canüle definitiv nicht entfernt werden. Diese Versuche weiter verfolgt, bildeten den Grundstein des schon angegebenen Verfahrens die Dilatation vom Munde aus mit conischen Zinnstäbchen zu erwirken. Aehnliche Versuche sind von Dupuis, mittelst der bekannten T-förmigen Canüle in einem Falle von Narbenbildung im unteren Kehlkopfabschnitte, die zur Stenose führte, mit gutem Resultate ausgeführt worden.

B. *Dilatation von Unten durch die Trachealfistel mittelst Sonden, Catheter, Schraubendilatatorien, Gummitampons.*

Die Schwierigkeiten der Einführung von Instrumenten vom Munde aus hatte eine Reihe von Aerzten zu Versuchen angeregt die Erweiterung von Unten durch die Trachealfistel zu probiren. Diese Methode wurde angewandt von Liston, Czermak, Busch, Victor von Bruns und vielen Andern, doch mit relativ geringem oder ungünstigem Resultate.

Eine zweite Reihe von Versuchen mittelst specieller Schraubendilatatorien oder Gummitampons die Stenose von Unten zu heben, war von besserem Erfolge gekrönt.

Hierher gehören die Beobachtungen von Parona, Stoerk, Braun, deren Resultate aus der Tafel 10 zu ersehen sind. In zwei Fällen wurde damit Heilung erzielt, und die Canüle entfernt; in dem dritten Falle der Patient mit dem Dilatationsapparate geheilt entlassen. Die Details dieser Apparate können hier nicht berücksichtigt werden.

Ausser diesen positiven Resultaten sind noch die Versuche mittelst eigener Instrumente die Strictur zu dilatiren von Seiten Gerhardt's, Paul Bruns', Professor Burow's und meine eigenen zu verzeichnen, deren Resultate als ungenügend bezeichnet werden müssen, oder nicht näher bekannt geworden sind.

Eine Durchsicht der hier in aller Kürze skizzirten Fälle ergiebt, dass über diese Methode der Dilatation nicht zu voreilig der Stab gebrochen werden soll, wie dies bisher einige Mal geschehen. Obwohl die anatomischen Verhältnisse des Kehlkopfs die Dilatation vom Munde aus als die rationellste erscheinen lassen, so sind doch wiederum gewisse Umstände, welche für die Erweiterung von Unten aus sprechen. Vor Allem ist hier die Thatsache in Betracht zu ziehen, dass, während die Methode der Dilatation vom Munde aus eine perfekte Technik aller endolaryngealen Behandlungsmethoden erfordert, und daher nur von Specialisten geleitet werden kann, die Behandlung von der Trachealfistel von jedem Chirurgen, der mit dem Spiegel zu untersuchen versteht, versucht werden kann. Die guten Resultate, die Jelenffy auf diesem Wege mittelst Cauterisationen mit Wiener Pasta in einem Falle von Larynxstenose erlangte, die positiven Resultate von Stoerk, Parona und Braun fordern es, dieser Methode, trotz mancher ungünstiger Erfolge, grössere Berücksichtigung zu widmen und dieselbe in entsprechenden Fällen zu versuchen.

C. *Dilatation der Larynxstenosen von Oben, durch den Mund, mit Cathetern, Metallsonden, Schraubendilatatorien und Zinnbolzen (Schrötter's Methode).*

Dreieckige, gebogene Eisenstäbe verschiedener Dicke wurden von Oertel im Jahre 1863 zur Dilatation in einem sehr interessanten Falle von Larynxstenose nach Typhus benutzt, und bedeutende Besserung erzielt. Schrötter hat seinen Zinnbolzen die prismatische Form, als die entsprechendste, verliehen, und diese Behandlungsweise ist nun heute als das Normalverfahren nach ausgeführter Tracheotomie anzusehen. Paul Bruns hat sich in einer vor Kurzem publicirten Arbeit über Resection des Kehlkopfes über die Schrötter'sche Methode dahin ausgesprochen, dass sie nach seinen aus fünf Fällen gewonnenen Erfahrungen allerdings im Stande ist, eine allmälige Erweiterung selbst in schweren Fällen bis zu dem Grade zu erzielen, dass die Athmung bei geschlossener Canüle durch den Larynx möglich sei. Allein unter allen Umständen ist die Behandlung langwierig, Monate und Jahre in Anspruch nehmend, mit grossen Beschwerden für die Kranken verknüpft und nicht ganz gefahrlos, da bei energischer Dilatation zuweilen entzündliche Erscheinungen mit Schmerzhaftigkeit, Oedem, Abscessbildung und Fieber beobachtet worden sind.

Aus einem Privatschreiben, welches ich der Güte des Professor Burow verdanke, entnehme ich folgende Sätze über die mechanische Behandlung nach von Schrötter's Methode.

"Ich habe diese Methode wiederholt ausgeübt, sowohl die Einführung von Zinnbolzen, als die der durchbohrten Hartgummiröhren, habe aber nie einen zufriedenstellenden Erfolg gesehen. Die Stenosen bessern sich wohl etwas, aber es war mir in vorgeschrittenen Fällen, in denen die Patienten tracheotomirt waren, nie möglich die Canüle zu entfernen."

In demselben Sinne hat sich auch in letzter Zeit Professor Roser über diese Methode ausgesprochen.

Uebersehen wir nun die von mir gesammelten 36 Fälle von mechanischer Behandlung der Stenosen nach Schrötter's Methode, das heisst, mit Zinnbolzen, resp. später mit Hartgummiröhren, so finden wir, dass die Verengerung durch nachstehende Krankheitszustände bedingt war:

Perichondritis idiopathica	16	Fälle
Perichondritis nach Typhus	8	„
Perichondritis nach Lues	5	„
Perichondritis nach Variola	2	„
Entzündliche Stenose	2	„
Membranbildung	1	„
Chorditis hyper. inf.	1	„
Catarrh. chron. Papillomata	1	„
	36	Fälle

Von diesen 36 Fällen sind 31 wegen Perichondritis behandelt worden. In 8 Fällen, deren Einzelheiten in der Tabelle II. aufgenommen worden sind, konnte die Canüle entfernt werden; die Stimme ist als normal oder nahezu normal bezeichnet worden. In 10 Fällen wurde in Folge der Behandlung die Glottis bis zur Norm erweitert, die Stimme gebessert, doch konnte die Canüle nicht definitiv entfernt werden. In 4 Fällen, wo die Stenose so weit behoben wurde, dass die Canüle entfernt worden war, musste wegen Recidiv's des Uebels nach einer gewissen Zeit die Tracheotomie in der Narbe wiederholt werden. Die übrigen 14 Fälle ergaben entweder ein ganz negatives Resultat, oder eine unbedeutende Besserung.

Ferner ersahen wir aus den 8 geheilten Fällen, dass das Alter der Kranken zwischen 4 und 26 Jahren schwankte; dass die Stenosen vor der Behandlung

schon drei Monate bis zwei Jahre bestanden; dass die Dauer der Behandlung drei Wochen bis zwölf Monate in Anspruch nahm, und nur ausnahmsweise bei Labus im Durchschnitte drei Monate betrug. In den 18 durch Perichondritis erzeugten, mit negativem Resultate behandelten Fällen, betrug die Dauer der Behandlung durchschnittlich 1 bis $1\frac{1}{2}$ Monate, und scheint dieser Umstand der Hauptgrund der mangelhaften Erfolge zu sein.

Im Ganzen sind zu constatiren, auf 36 Fälle:

Vollständige Heilung und Entfernung der Canüle.	8
Erweiterung der Stenose bis zur Norm, doch Canüle gelassen	10
Negatives Resultat.	18
	36

Die Entfernung der Canüle konnte in vielen Fällen auf Grund einer Weigerung der Kranken nicht ausgeführt werden, trotzdem der Larynx seine normale oder nahezu normale Weite erlangt hatte, und die Stimme laut, wenn auch unrein, war.

Ausser den 36, nach Schrötter's Methode behandelten Fällen sind noch in der Tabelle 8 drei Beobachtungen verzeichnet, wo die Dilatation mit Bougies, Metallsonden oder Guttaperchazapfen erlangt worden war.

Hierher gehören die Beobachtungen von Stoerk, Asch, Weinlechner und die interessanten Versuche von Reyher, die es verdienten ausführlicher besprochen zu werden. In drei Fällen konnte die Canüle definitiv entfernt werden. Endlich finden wir noch in der neunten Tabelle vier Beobachtungen, wo mittelst specieller Instrumente die Dilatation vom Munde aus vorgenommen war, nämlich ein Fall von Navratil, einer von Oertel, zwei von Whistler.

Es wurde damit erzielt:

Heilung	3 Mal
Besserung	1 Mal

In einem Falle von Whistler konnte die Canüle entfernt werden.

Verzeihen Sie, meine Herren, wenn ich Ihre Zeit und Geduld so lange mit trockenen Ziffern und statistischen Tabellen in Anspruch genommen habe. Die mechanische Behandlung der Larynxstenosen lässt sich nicht mit wenigen Worten abfertigen, und verdient Beobachtung, als eine der schwierigsten laryngochirurgischen Behandlungsweisen, die, wenn gelungen, den Arzt mit gerechtem Stolz erfüllen kann. Selbstverständlich kann diese Methode nur bei gewissen Formen von Larynxstenose von gutem Erfolge gekrönt sein, angenommen, dass die Cur von einem mit der laryngochirurgischen Technik vollkommen vertrauten Arzte geleitet wird. Sie wäre vorwiegend bei mässig alten, nicht cylindrischen Stenosen zu versuchen, und zwar nach dem Verschwinden der entzündlichen Symptome und jeder Spur von Fiebererscheinungen. Ihre Resultate lassen sich in folgenden Schlusssätzen formuliren:

1) Das bisher relativ gering ausfallende positive Resultat hat seinen Grund in dem Mangel an Geduld und Ausdauer von Seiten der Kranken, manchmal der Aerzte.

2) Die positiven Fälle, so unter anderen die Beobachtungen von Labus beweisen, dass bei einer energischen, aber trotzdem vorsichtigen Behandlung sogar in veralteten Fällen von narbiger, im Gefolge von Typhus oder Variola entstandener Perichondritis dauernde Heilung, das heisst, Entfernung der Canüle erzielt werden kann.

3) Die durch zu rasches Dilatiren erzeugten entzündlichen Symptome fordern eine Unterbrechung der Cur.

4) Bei Anwesenheit von Narbenwülsten, Verwachsungen, Granulations-

wucherungen, ebenso im Larynx, wie in der Trachea, müssen dieselben durch entsprechende chirurgische Eingriffe beseitigt werden, um mit Erfolg die Stenose dilatiren zu können. Diese Eingriffe können sowohl endolaryngeal wie auch von der Trachealfistel vorgenommen werden; doch verdient die Behandlung von Oben den Vorzug. Die mangelhafte Berücksichtigung dieser Punkte scheint in vielen Fällen der Grund der negativen Resultate zu sein.

5) Hochgradige cylindrische Stenosen, die durch mit Necrosis einhergehender Perichondritis entstanden sind, eignen sich nicht für diese Behandlungsweise, und sollten durch Laryngotomie resp. partielle Kehlkopfresection beseitigt werden.

6) In Ermangelung von Schrötter'schen Zinnbolzen, könnten Beniques von verschiedener Dicke mit Erfolg benutzt werden. Falls die Einführung von Zinnbolzen vom Munde aus auf Schwierigkeiten stösst, lassen sich dieselben mittelst einer dünnen Belloc'schen Röhre durch die Stenose von der Trachealfistel aus dirigiren.

7) Die mechanische Behandlung der Larynxstenosen ist als ein bedeutender Fortschritt der Laryngochirurgie, und als ihr Begründer, mit vollem Rechte, Schrötter zu bezeichnen.

DISCUSSION.

Dr. Tornwaldt, Dantzig: The main difficulty of the treatment consists in the slight toleration of hard instruments by the larynx. In order to obviate this, I have had an instrument constructed of soft india-rubber, consisting of an inner thick tube with an opening at the top and an external thinner rubber tube, balloon-shaped. The balloon is inflated with water by means of a syringe. The introduction is made from the tracheotomy wound and through the opening of the canula, the proper form having been given to the instrument by means of a flexible pilot.

Dr. Grossmann, Vienna: To-day, thanks to the work of my esteemed teacher, Professor von Schrötter, we can promise, in all cases in which the exciting cause does not render the disease incurable, full success. To obtain such result, however, we must not be satisfied by simply dilating, but treat also the morbid process which has caused the stenosis. I consider tubage indicated in diphtheria and croup in those cases only in which it is desired to gain time for the performance of tracheotomy, otherwise, I think, it is a *noli me tangere*.

Dr. Max Schäffer, Bremen: I am able to add to the reported cases five new ones, in which the ideal end of obtaining improvement, or even cure, without previous tracheotomy was obtained. The first two cases belong to the class of acute, the three others to the class of chronic stenosis. 1. The patient, a gentleman, with numerous tumefactions in the larynx caused by syphilis, nearly aphonic, began to suffer from attacks of suffocation in consequence of œdematous swelling of these new formations. The impending danger to life was got rid of by the introduction, twice daily, of Schrötter's hard caoutchouc tubes. Time was gained for the endo-laryngeal removal of the tumours. The patient died two years later from pulmonary tuberculosis, most likely caused by syphilis which had existed for ten years. The voice had been greatly improved. 2. A syphilitic woman suffered from attacks of suffocation in consequence of acute rapid infiltration of the laryngeal mucosa and submucosa; she was sent to me to have tracheotomy performed. By constant tubage, however, so much time was gained that an energetic mercurial treatment could be instituted. This, in turn, produced retrogressive change in the

infiltration, and in a short time complete cure, with restitution of the normal voice. 3. The patient was a woman with a stenosis caused by perichondritis thyroidea. There was an external abscess extending down to the cartilage without, however, producing sequestration, which healed with a puckered-in cicatrix. The voice was completely aphonic. Daily tubage for several minutes has been continued up to the present time. The patient now—*i.e.*, one year after the beginning of the treatment—speaks with a rough, deep voice, which, it is hoped, will still further improve. 4. A woman was attacked with pneumonia after erysipelas of the face, and in the course of this perichondritis thyroidea supervened. One night she thought that she would have been choked. After violent efforts something in the larynx seemed to burst, and a large quantity of badly-smelling pus was evacuated. Half a year after this she consulted me, as since that time a gradually increasing dyspnœa had made its appearance. The woman was much emaciated. Examination of the lungs, however, yielded no positive result. The laryngoscopic examination showed that there was a stenosis at the level of the ventricular bands. The vocal cords were scarcely visible, and were later on seen to be defective in their anterior parts. Speech was entirely inarticulate; respiration very laborious, and associated with a loud stridor. For four weeks tubage was made twice daily, each time for fifteen minutes. The lumen of the larynx became normal, and the voice almost good. The woman has had a child since the operation. Now—*i.e.*, one year later—feels quite well. 5. Man, still under treatment. The stenosis is caused by chronic inflammation of the mucosa and submuscosa of the larynx at the level of the ventricular bands. Tubage. The voice, which in the beginning was almost absent, is already good and respiration nearly free, so that the man can work for hours.

Indications for the Complete or Partial Extirpation of the Larynx.

Dr. Foulis, Glasgow.

Advances in surgery, as in other arts, commonly meet with obstruction, which they must overcome before they are recognized as genuine or safe; and even then a certain period of probation is necessary to define clearly the path in which the new methods may be followed. It is this period of probation and scrutiny through which the operation of excision of the larynx is now passing; and the object of this discussion is to point out the cases in which, according to present experience, excision may be practised.

First performed in man by Patrick Heron Watson, of Edinburgh, in 1866, this operation was only introduced to the profession in 1873, by Billroth, in Vienna; but since that date it has made so much progress in the favour of surgeons, that I am able to present to you a list of thirty-two cases in which the larynx has been completely removed. It has become one of the standard operations of surgery, and doubts as to its feasibility are now replaced by a desire to improve its details and to define its proper place. This may be assisted by examination of the cases of complete excision on the roll.

These may be divided into three groups, according to the causation.

1.—Cases of complete excision for non-malignant disease, two in number. The first of these cases was also the first in which the operation was ever resorted to in man; and I may, therefore, relate it briefly in the words of the operator, Dr. Heron Watson, of Edinburgh, who, in a letter to me, dated April 1, 1881, says:—"The first case (in 1866) was a gentleman, aged thirty-six,

suffering from tertiary syphilis, with destruction of the laryngeal cavity. I had previously, about a year before, opened his trachea to relieve him from the ulcerative condition. The larynx then healed, but the puckering gave rise to a condition of matters by which some portion of all fluid nutriment and saliva made its way into the trachea, and occasioned fits of spasmodic cough. Feeding by the tube did not prevent the saliva from passing down, and in almost every instance on its withdrawal some fluid regurgitated, and some part of it passed into the trachea, &c. I operated by a linear incision, and clearing the trachea first above the tracheotomy opening, I cut it right across, introduced a gum elastic tube (a full-sized lithotomy tube), and tied the trachea upon it by a piece of silk ligature. I then cleared the soft parts from the larynx by means of the points of probe-pointed scissors, using them to pull away the structures when one could, and clipping with them when this was necessary. The patient rallied from the operation, but died some weeks afterwards from pneumonia."

The second case in this group is one in which Rubio, of Madrid, removed the larynx, owing to necrosis of the laryngeal cartilages, in a man aged forty-one, the case ending fatally in five days by marasmus. In both of these instances there was great debility before the operation, and this rendered them less hopeful.

2.—Cases of sarcoma of the larynx, five in number. The result in these five patients was very good. One of them (by Bottini) is alive and well six years after operation; one (by Caselli) is alive and well nearly two years after removal of larynx, pharynx, tonsils, and soft palate. Three of the five patients have died; but of these, one (by myself) lived seventeen and a half months, and succumbed, not to a recurrence of the sarcoma, but to phthisis; another (by Czerny) lived fifteen months, and died from recurrence of the sarcoma; while the third patient (by Lange), an old man of seventy-four years, died from asthenia nearly seven months after the operation.

This group of cases, then, is a brilliant one, all the patients in it having decidedly benefited by the surgical procedure.

3.—Cases of cancer of the larynx, twenty-five in number. The death-rate here is very high, partly because of the debility and advanced age of the patients, and partly owing to the infiltrating nature of cancer, which necessitated, in some of the cases, extensive cutting operations wide of the larynx, and favoured in all a speedy recurrence of the disease in the vicinity. Only three out of this group of cases are not recorded as having died at longer or shorter periods after operation—namely, one (by Wegner) in which I have not received any details after the seventh month, at which time there was no recurrence; and two (by Czerny and by myself) operated on three months ago, and both now alive and well. Not one of the patients in this group has been reported as alive at the end of a year after operation, and only two of them have lived even nine and ten months respectively.

This is a gloomy account; but it loses some of its forbidding aspect when more closely examined. In order to avoid repetition of details, let us consider the three groups together, and try to discover the more prominent causes of the formidable mortality. I say formidable, for out of the thirty-two cases, sixteen (or one half) died in or near the first fortnight; nine terminated fatally within ten months; two within one and a half years; and only five are alive—one of these being not reported on after the seventh month, and two others only dating as yet three months from operation. This leaves two patients alone who have lived fairly past the two years succeeding the operation. Why have so many of them died?

(*a*) The heaviest factor in the death-rate is the immediate risk after operation; and analyzing it, we find that of the sixteen cases dying in or near the first fortnight, eleven are set down as due to pneumonia, two to pyæmia,

and three to collapse. The danger of lung complications, therefore, must, in the first place, be carefully guarded against. I am convinced that two chief exciting causes of the lung mischief are—(1) trickling of fluid into the air passages by the side of the tracheal tube, and (2) variations in the temperature of the air; and, therefore, I would advocate the use of a very wide tracheal tube, quite filling the trachea after operation, and the maintenance, night and day, of a temperature of say 70° Fahr.

Another source of danger is pyæmia; and here our safety lies in the free use of zinc chloride solution to the raw surface at the completion of the operation, avoidance of all and every form of dressing to the wound surface, very careful removal of fluids accumulating in it, and syringing with Condy's fluid at regular intervals.

Last among the immediate dangers is collapse, best warded off by careful feeding through a permanent gullet catheter.

(*b*) Later on the recurrence of the disease increases the death-rate, seven patients succumbing to it. This is intimately connected with the question of the extent to which the disease has been allowed to advance. From an exaggerated fear of the operation, and also owing to the limited use of the laryngoscope, the disease has run on until neighbouring parts were involved, rendering the operation, when at length undertaken, both extensive and severe. Not the larynx only, but parts of the tongue, pharynx, and gullet, as well as enlarged lymphatic glands, have had to be removed, and thus the chances of recurrence were greater. It is to be hoped that a more general use of the laryngoscope will bring such cases earlier under notice; and also that improvements in the operation itself may render it less feared and more readily resorted to.

(*c*) Then we must not forget the influence of age on the mortality. In the cancer group the average age is fifty-four and a half years, two patients being over seventy years old. In the sarcoma group the age is thirty-eight years, one patient being over seventy. In the non-malignant group the average age is thirty-eight years. Need we wonder at the high mortality in the cancer group when we reflect on the advanced age and extensive disease in its members? It is not too much to expect that earlier operation will yet improve the statistics in cancer cases.

Bearing in mind, then, the experience gained in the past, what are the cases in which the larynx may be extirpated in the future?

I think it will be conceded that the sarcoma group has been so successful as to render the operation admissible at once on recognition of the disease, and in this group I would include papillomata which recur after fair and clean removal, for we know that they have a strong malignant tendency in many cases.

The cancer group also I consider as within the scope of the operation—excluding cases of very advanced age, for I do not regard a patient over seventy as a proper subject of operation for cancer; and excluding also cases in which the lymphatic glands of the neck are involved, for then the disease is practically not within our reach. It may be true that eventual recurrence in the best selected cancer case is always to be looked for, but the scanty lymphatic supply of the larynx renders recurrence slower, and we give to our patient at all events a period of relief from suffering, and, if the artificial larynx is well fitted in, a term of comfortable and useful and hopeful existence. And is that not a good result? It will be contended that a simple tracheotomy operation ensures as long, or a longer, continuance of life as the much more dangerous operation of extirpation. But the quality of the life so prolonged must be weighed also; and in the absence of pain, ease of swallowing, freedom from the

terrible burden of an ever-present malignant disease, we have advantages which are only secured by the removal of the part affected.

But what are we to say about the group of non-malignant cases? May we excise the larynx as we would a knee-joint when it is hopelessly thickened and ulcerated? When the breathing and the voice are impeded, and the parts are no longer capable of distension by dilators, it appears to me that the diseased larynx may properly be removed and replaced by an artificial one. That there are such cases, especially in old-standing catarrh of syphilitic origin—cases in which dilatation is useless—no one will deny. In such patients I would not hesitate to remove the larynx.

This brings up the subject of partial extirpation of the larynx, for it is in such stenosed non-malignant cases that partial removal might have advocates. By partial extirpation I understand the removal of part of the laryngeal cartilages. I exclude mere thyrotomy. No doubt such cases as that in which Lister split the larynx and cleared out the vocal cords, &c.—an operation which I have lately repeated with excellent results—is a partial excision in a sense, but the term seems to me rather to refer to the excision of part of the cartilages.

Of such operations my list contains six examples. In four the larynx was split in the middle line, and one-half of it taken away—an operation introduced by Billroth in 1878. Two of the cases were for cancer, one (by Billroth) dying of recurrence in six months; and the other (by Reyher) alive and free from recurrence at the end of fourteen months. In one case (Gerster) of sarcoma, the right wall of the pharynx, right half of the larynx, right tonsil, right half of hyoid bone, whole of epiglottis, and part of the base of the tongue, were taken out, and a year later the patient died of pleurisy, without recurrence of the sarcoma. The remaining case (Caselli) was one of a large chondroma in the neck, in the excision of which one-half of the larynx had to be removed; this case ended fatally in two days. Two more cases I may quote from my own practice, in both of which there was old and extreme stenosis, owing to catarrhal thickening. In both I cut out a disc of the anterior part of the cricoid and lower edge of thyroid cartilages, and inserted a large vulcanite trachea tube—purposing, later on, to use a dilator-larynx through this opening. One of these cases died of diabetes and cellulitis of the leg, two months after operation; the other developed perichondritis of the larynx, refused further operation and returned home, where he died in three months. The result of these six cases is then indecisive, but not very encouraging. From a study of them, and keeping in view the good result of complete excision, I do not hesitate to recommend complete in preference to partial excision in any case where the latter seems to be necessary. By complete excision we avoid the risk of perichondritis, and we get the disease more thoroughly out, while I cannot see that it is much, if at all, more serious.

In conclusion I would sum up, thus:

1. Total is better than partial excision of the larynx.
2. The extirpation of the larynx for malignant disease is required as soon as the diagnosis is clearly made; but
   - (*a*) When the cervical glands are involved, these may be a barrier to the operation; and
   - (*b*) Very old people—*e.g.*, above seventy years of age, are not fit subjects for this operation.
3. The larynx may be excised in certain intractable cases of advanced thickening and stenosis, even though this be of non-malignant origin.

Table of Cases of Complete Extirpation of the Larynx.
To Illustrate Dr. D. Foulis' Paper.

Based on and extending the Table in MORELL MACKENZIE'S Work.

No.	Name of Operator.	Date.	Patient's		Disease.	Parts Removed.	Immediate Result.	Further Remarks.	Recorded in
			Age.	Sex.					
1	Patrick Heron Watson (Edinburgh).	1866.	36	M.	Syphilitic. Scarred contracted state of larynx, especially at its upper end.	Larynx and one ring of trachea.	Patient rallied, but died in three weeks from pneumonia.	Patient was in a very weak state, and there was pneumonia suspected before the operation.	Letter from Dr. Watson to Dr. Foulis.
2	Billroth (Vienna).	1873, 31st Dec.	36	M.	Carcinoma of the larynx.	Part of the two upper tracheal rings, cricoid, thyroid, both arytenoid cartilages, and lower third of the epiglottis.	Recovery.	Death from recurrence of the carcinoma, seven months after operation. No P.M.	*Archiv fur Klin. Chirurgie*, Band xvii. Heft ii. p. 343.
3	Heine (Prag).	1874, 28th Apr.	50	M.	Carcinoma of the larynx.	Larynx in toto.	Recovery.	Death from recurrence of the disease six months later.	*Archiv fur Klin. Chirurgie*, Band xix. p. 584.
4	M. Schmidt (Frankfurt).	1874, 12th Aug.	56	M.	Carcinoma of the larynx.	Cricoid, thyroid, and both arytenoid cartilages.	Death on the fifth day after operation from collapse.	...	*Archiv fur Klin. Chirurgie*, Band xviii. Heft i. p. 189.
5	Maas (Freiburg). (At that time in Breslau).	1874, 1st June.	57	M.	Adeno-fibroma carcinomatosum.	Larynx in toto.	Death two weeks after operation from pneumonia.	...	*Archiv fur Klin. Chirurgie*, Band xix. p. 507.
6	P. H. Watson (Edinburgh).	1874.	60	M.	Epithelioma of larynx extending to left vocal cord.	Larynx.	Death in two weeks from pneumonia.	...	Letter from Dr. Watson to Dr. Foulis.
7	Schönborn (Königsberg).	1875, 22nd Jan.	72	M.	Carcinoma of the larynx.	Larynx in toto.	Death a few days after operation.	...	*Berliner Klinische Wochenschrift*. 1875, No. xxxviii. p. 525.
8	Bottini (Turin).	1875, 6th Feb.	24	M.	Sarcoma of the larynx, partly round-celled, partly spindle-celled.	Larynx in toto.	Cure. This patient in May, 1878, was perfectly well, working in the fields, and acting as a postman between Miazzina and Trabaro. (Letter from Signor Domenico Barozzi, Sindaco of Miazzina.)	This is the most successful case on record, the patient having been able to undergo considerable bodily labour after the operation. (Well on April 19, 1881. Letter from Prof. Bottini to Dr. Foulis.)	"Communicazione letta Innanzi, La R. Academia di Medicina di Torino" dal Prof. E. Bottini, Seduta del 30 Aprile, 1875.
9	v. Langenbeck (Berlin).	1875, 21st July	57	M.	Carcinoma of the upper part of the larynx, the epiglottis and the hyoid bone.	Larynx in toto, hyoid bone, part of the tongue, pharynx, and œsophagus.	Recovery.	Death four months after the operation from recurrence of the carcinoma in the lymphatic glands of the neck.	*Berliner Klinische Wochenschrift*, 1875, Nro. 33, p. 453; and *Archiv fur Klin. Chirurgie*, vol. xxi. Supplement-band, p. 136.

No.	Name of Operator.	Date.	Patient's Age.	Patient's Sex.	Disease.	Parts Removed.	Immediate Result.	Further Remarks.	Recorded in
19	V. Bruns, sen. (Tubingen).	1878, 29th Jan.	54	M	Epithelioma of the larynx.	Entire larynx.	Recovery.	Preliminary tracheotomy was not performed. Died Nov. 1, 1878, from recurrence.	*Wiener Med. Presse*, Nov. 17, 1878. Further communication from Professor Paul Bruns.
20	Rubio (Madrid).	1878, 11th May.	41	M	Necrosis of the cartilages of the larynx.	Entire larynx.	Death on the fifth day after the operation from marasmus.	...	"Observacion Clinica," &c. Real Academia de Med. Madrid, 1878.
21	Czerny (Heidelberg).	1878, 24th Aug.	46	M	Sarcoma in and under vocal cords, and perforating the thyroid cartilage, also involving the neighbouring glands.	Larynx and glands.	Recovery.	Repeated removal of recurring masses. Death Nov. 30, 1879, fifteen months after operation.	Letter from Geh. Hofrath Czerny to Dr. Foulis. (See also Schüller in Billroth and Luecke's *Deutsche Chirurgie*.
22	Billroth (Vienna).	1879, 27th Feb.	43	F	Epithelial cancer of the pharynx, larynx, and thyroid gland.	Entire larynx, with part of pharynx and œsophagus.	Recovery.	Death from passage of bougie into mediastinum after six weeks.	Private communication by Professor Billroth.
23	Wm. Macewen (Glasgow).	1879, 31st July.	56	M.	Cancer of larynx and upper end of gullet, also a glandular mass at left side of neck.	Larynx, part of the gullet, and the glandular mass.	Death in three days from pneumonia.	...	Case-books of Glasgow Royal Infirmary.
24	Cav. Azzio Caselli (Reggio-Emilia).	1879, 20th Sept.	19	F.	Sarcoma of larynx, pharynx, palate, and base of tongue.	Larynx, pharynx, base of tongue, soft palate, and tonsils.	Recovery.	Well and fit for work in April, 1881, *i.e.*, twenty months after operation.	*Bulletino delle Scienze Med. di Bologna*, vol. v. 1880; and letter from Dr. Caselli to Dr. Foulis.
25	F. Lange, (New York).	1879, 12th Oct.	74	M	Sarcoma of larynx, involving the gullet.	Larynx, right horn of hyoid bone, part of gullet.	Recovery.	Recurrence of a nodule of the sarcoma. Death six months and twenty-four days after the operation from asthenia.	*Archives of Laryngology*, vol. i. p. 30.
26	Carl Reyher (St. Petersburg).	1880.	48	M.	Carcinoma.	Larynx.	Death at the seventh day from broncho-pneumonia septica.	...	Letter from Dr. Reyher to Dr. Foulis, and Wolner's *Med. Jour.*, 1880, Heft i.
27	Czerny (Heidelberg).	1880, 11th Oct.	47	M	Epithelioma of larynx and soft parts over it.	Larynx and soft tissues in front of it.	Recovered.	Glands affected in Jan. 7, 1881. Death from exhaustion and hæmorrhage on 25th March, 1881.	Letter from Geh. Hofrath Czerny to Dr. Foulis.

No.	Name of Operator.	Date.	Patient's		Disease.	Parts Removed.	Immediate Result.	Further Remarks.	Recorded in
			Age.	Sex.					
28	H. Bircher (Aarau).	1880, 3rd Dec.	49	F.	Scirrhus of the thyroid gland, involving the larynx.	Thyroid gland exeised; six months later the cancer recurred, and the larynx was excised with part of the gullet.	Death in sixteen days from pneumonia and gangrene of lung.	...	Letter from Dr. Bircher to Dr. Foulis.
29	Pick (London).	1881, 16th Jan.	39	M.	Epithelioma of larynx (preceded by papillomata).	Larynx and epiglottis.	Death in five days from pleurisy and pericarditis.	...	*Lancet*, April 2, 1881, p. 541.
30	Foulis (Glasgow).	1881. 30th April.	50	M.	Epithelioma of larynx (preceded by papillomata).	Larynx.	Recovery.	Went home in five weeks, is now well and strong.	*Brit. Med. Jour.* May 7, and June 11, 1881.
31	Czerny (Heidelberg).	1881, 12th May.	47	M.	Epithelioma.	Larynx and two upper rings of trachea	Recovered.	Went home in six weeks, is now well and strong	Letter from Dr. Czerny to Dr. Foulis
32	Carl Reyher (St. Petersburg).	1881, 14th May.	57	M.	Carcinoma.	Larynx.	Death at fifth day from broncho-pneumonia septica.	...	Letter from Dr. Reyher to Dr. Foulis

Cases of Partial Excision of the Larynx.

No.	Name of Operator.	Date.	Patient's		Disease.	Parts Removed.	Immediate Result.	Further Remarks.	Recorded in
			Age	Sex.					
1	Foulis (Glasgow).	1878, 29th Jan.	59	M.	Old catarrhal and extreme stenosis of larynx. (Diabetes).	The front part of cricoid cartilage.	Recovery.	Death in two months from sloughing cellulitis of leg.	Case - book, Glasgow Training Home for Nurses.
2	Foulis (Glasgow).	1878, 30th May.	60	M.	Old and extreme stenosis of larynx, malignant.	The front part of cricoid cartilage.	Recovery.	Death in two and a half months. Exhaustion. No exact details.	Case - book, Glasgow Training Home for Nurses.
3	Billroth (Vienna).	1878, 7th July.	50	M.	Epithelioma of larynx, left vocal cord, and under.	The left half of larynx.	Recovery.	Death from recurrence in six months.	Morell Mackenzie's work. Table of Cases in vol. i.
4	Arpad Gerster (New York).	1880, 5th Mar.	50	M.	Sarcoma of right part of pharynx and larynx, and base of tongue.	Right half of hyoid and larynx and pharynx, right tonsil, epiglottis, and part of base of tongue.	Recovery.	Died 9th March, 1881, of pleurisy. No recurrence of the sarcoma.	*Archives of Laryngology*, vol. i. p. 124, and letter from Dr. Gerster to Dr. Foulis.
5	Carl Reyher (St. Petersburg).	1880, 9th Mar.	57	M.	Carcinoma.	Left half of larynx.	Recovery.	No return of the disease at fourteenth month.	Letter from Dr. Reyher to Dr. Foulis.
6	Cav. Azzio Caselli (Reggio-Emilia).	1880, 9th Nov.	27	M.	Enchondroma of neck.	A large tumour and right ala of thyroid cartilage.	Death in two days.	...	Pamphlet by Dr. Caselli.

Die Indicationen für die gänzliche oder theilweise Exstirpation des Kehlkopfs.

Dr. Philipp Schech, München.

Die Entwickelung der Laryngoskopie zu einer selbständigen Disciplin brachte es mit sich, dass manche früher vom Chirurgen geübte Operation in die Hände des Laryngoskopikers überging. So ist es, um nur ein Beispiel anzuführen, allgemein anerkannt, dass die Entfernung der Kehlkopfneubildungen auf endolaryngealem Wege den Vorzug verdient, und jedenfalls zuerst versucht werde, ehe man zu andern Methoden schreitet. Dass aber die endolaryngealen Encheiresen trotz der hohen Vervollkommnung, die sie in den letzten Jahren erfahren haben, nicht in allen Fällen ausreichen, wird Jeder mit der Sache einigermassen Vertraute gerne zugestehen.

Es wäre aber ebenso kritiklos, den Werth der endolaryngealen Methoden verdächtigen, als die Berechtigung anderweitiger blutiger Eingriffe in den Kehlkopf von der Hand weisen zu wollen.

Desshalb erscheint es nöthig, präciser als es bisher geschah, die Bedingungen abzuwägen, unter welchen das eine oder das andere Verfahren den Vorzug verdient; zur Discussion dieses Themas Anlass gegeben zu haben, ist das grosse Verdienst der geehrten Herren Präsidenten und Secretaire dieses Congresses. Wenn wir wünschen, dass die Errungenschaften der Laryngologie, die sich ihres jetzigen Standes wahrlich nicht zu schämen braucht, bei dem modernen Arzte Berücksichtigung finden mögen, so ist dies sicherlich kein unbilliges Verlangen, wir werden aber auch andrerseits nicht zögern, dem Chirurgen da das Messer in die Hand zu geben, wo unsere Hilfsmittel ungenügend erscheinen.

Dies ist nun meistentheils der Fall bei den bösartigen Neubildungen des Kehlkopfes, die wegen ihres raschen Wachsthums in Fläche und Tiefe, und ihrer ausgesprochenen Tendenz zu Recidiven für die zeitraubenden und delicaten laryngoskopischen Manipulationen sich wenig eignen. Nachdem Czerny und Billroth die Möglichkeit der vollständigen, Heine der theilweisen Exstirpation des Kehlkopfes demonstrirt hatten, folgte eine Reihe von Mittheilungen welche bei der Ohnmacht anderweitiger Heilmethoden die Berechtigung obengenannter Operationen ausser Zweifel stellten. Das bis jetzt vorliegende Material ist freilich noch zu gering, als dass man nach allen Richtungen hin erschöpfende Antworten erwarten könnte, doch dürften sich nach den bisher gewonnenen Erfahrungen die Indicationen und Contraindicationen der in Rede stehenden Operationen zur Zeit etwa in folgender Weise formuliren lassen.

I.

Die gänzliche Exstirpation des Kehlkopfes ist indicirt:

1) Bei allen bösartigen Neubildungen, die grosse Strecken oder mehr als die Hälfte des Kehlkopfes befallen, die Nachbarorgane aber verschont haben.

Wenn ich zur Bedingung mache, dass die Neubildung grössere Strecken oder mehr als die Hälfte des Kehlkopfes befallen habe, so geschieht dies mit Rücksicht auf die Indicationen für die theilweise Exstirpation die, wie wir später sehen werden, aus mehr als einem Grunde günstigere Chancen bietet. Wenn ich ferner verlange, dass die Nachbarorgane des Kehlkopfes gesund, d. h. noch nicht von der Neubildung occupirt sind, so stütze ich mein Postulat auf die Erfahrung, dass in jenen Fällen, in welchen die Neubildung auf den Larynx beschränkt war, die relativ besten Resultate erzielt wurden. Wenn aber auch in diesen Fällen noch häufig Recidive auftraten, so ist zu bedenken, dass bisher die Operation erst in einem sehr späten Stadium vorgenommen wurde, also zu erwarten steht, dass bei möglichst frühzeitigem Eingreifen die

Resultate sich günstiger gestalten werden. Dass übrigens die Sarcome eine viel bessere Prognose gestatten, als die eigentlichen Carcinome oder malignen Papillome, geht aus den bisherigen Beobachtungen mit Sicherheit hervor.

Die Totalexstirpation des Kehlkopfes ist ferner angezeigt:

2) Bei den durch excessive Hypertrophie des Ring- und Aryknorpels und deren Schleimhautüberzug bedingten Schlingbeschwerden, bei denen die Ernährung durch das Schlundrohr unmöglich und die Ernährung per anum ungenügend ist.

Ich habe in erster Linie jene Affection im Auge, die man nach Dr. Whistler's Vorgange als chronisches syphilitisches Fibroid des Kehlkopfes bezeichnet. Wenn auch meist nur die Weichtheile, besonders Mucosa und Submucosa an der Volumzunahme theilnehmen, so kommt es doch auch gar nicht selten zu reichlicheren Proliferationsvorgängen an Knorpel und Perichondrium. In der Regel mag die theilweise Exstirpation zur Hebung der dringlichsten Beschwerden ausreichen, ja selbst die Tracheotomie; wenn aber der Kehlkopf für Respiration, Phonation und Deglutition ganz unbrauchbar geworden ist, dann erscheint es angezeigt, denselben total zu entfernen. Hieher gehören ferner die Ecchondrosen, Enchondrome und Knorpelwucherungen mit nachfolgendem Zerfall, wie Türk in seiner Klinik der Kehlkopfkrankheiten einen derartigen Fall (Nr. 80) beschrieben hat, vorausgesetzt, dass ihre Entfernung auf anderem Wege mittelst Enucleation* oder theilweiser Resection,† unmöglich ist. Auch bei complicirten Knorpelfracturen, besonders den Zermalmungen der Knorpel dürfte die Totalexstirpation eine Zukunft haben. Endlich möchte ich Schüller beistimmen, wenn er in seinem vortrefflichen Werke pag. 202 sagt, dass die Schlingbeschwerden der Krebskranken schon mit Rücksicht auf die das lethale Ende beschleunigenden Schluckpneumonieen die Totalexstirpation als Indicatio vitalis rechtfertigten.

Die Totalexstirpation halte ich für contraindicirt:

1) Bei allen gutartigen Geschwülsten und multiplen Papillomen, wenn sie auch nicht vollständig auf andere Weise entfernt werden können und öfter recidiviren.

Ich begründe diese These mit der Behauptung, dass man immer im Stande sein wird, durch endolaryngeale oder laryngotomische Eingriffe die bedrohlicheren Symptome für längere Zeit vollständig zu beseitigen. Ferner lehrt die Erfahrung, dass man selbst nach wiederholten Recidiven die Hoffnung auf Radicalheilung nicht aufgeben dürfe. Ich halte es demnach für unverantwortlich, in derartigen Fällen eine Operation ausführen zu wollen, welche die Kranken nicht nur in die augenscheinlichste Lebensgefahr bringt, sondern auch für das ganze Leben zum Tragen einer Canüle verurtheilt.

Ich halte ferner die Totalexstirpation für contraindicirt:

2) Bei Perichondritis und Necrose der Knorpel.

Wenn Federigo Rubio wegen Perichondritis die Totalexstirpation ausführte, so lassen sich dagegen sehr gewichtige Gründe geltend machen. Die Perichondritis ist meistentheils eine secundäre, d. h. eine durch ein dyskrasisches Allgemeinleiden hervorgerufene Lokalaffection. Gibt die Dyskrasie Aussicht auf Heilung, wie dies bei Syphilis in der That oft der Fall ist, so wird sich die innerliche Medication auch in Bezug auf das Lokalleiden geltend machen; der Process wird entweder stillestehen, es wird nach längerer oder kürzerer Zeit relative Heilung eintreten, oder die Zerstörung wird fortschreiten; letzteren Falles genügt in der Regel die Vornahme der Tracheotomie oder nach

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* Vergleiche die jüngste Mittheilung von Ehrendorfer in *Langenbeck's Archiv*, Bd., xxvi. pag. 578.

† Vergl. die Mittheilung von Prof. Azzio Caselli, Reggio Emilia, 1880.

geschehener Vernarbung eine endolaryngeale Operation oder die Thyreotomie oder Resection zur Hebung der zurückgebliebenen Beschwerden. Ist aber die Perichondritis tuberculöser Natur, so erscheint es umsomehr geboten, sich auf die gewöhnlichen operativen Eingriffe zu beschränken, als die Erfahrung lehrt, mit welch' erschreckender Regelmässigkeit derartige Kranke selbst nach Heilung des Lokalleidens ihrer Lungenaffection erliegen. In den ausserordentlich seltenen Fällen von primärer Perichondritis endlich wird man gleichfalls im Stande sein, durch Tracheotomie, endolaryngeale, oder thyreotomische Eingriffe Abhilfe zu schaffen.

Die totale Entfernung halte ich endlich auch für contraindicirt:

3) Bei allen bösartigen Neubildungen, die entweder schon zu krebsigen Affectionen benachbarter oder entfernterer Organe geführt haben oder mit anderen schweren, nicht krebsigen Krankheiten combinirt sind.

Die Erfahrung hat gezeigt, dass Recidive dann am häufigsten und raschesten auftraten, je mehr die Nachbarorgane, Zunge, Pharynx oder Oesophagus von der Neubildung in Mitleidenschaft gezogen waren. Lymphdrüsenschwellung allein dürfte jedoch keine absolute Contraindication abgeben. Anders verhält es sich jedoch dann, wenn noch anderweitige unheilbare Störungen vorhanden sind, wie z. B. Affectionen des Herzens, Lungenphthise, Morb. Brightii. Ich selbst habe einen derartigen Fall beobachtet und im Bande xxiii. des *Archivs für klinische Medizin* beschrieben; der Kranke starb an Pneumothorax, bevor noch das Larynxcarcinom stenotische Erscheinungen erzeugt hatte.

II.

Die theilweise Exstirpation des Kehlkopfes, nach ihrem Begründer, Heine, Resection oder subperichondrale Resection des Kehlkopfes genannt, ist indicirt:

1) Bei allen hochgradigen, unnachgiebigen und röhrenförmigen Larynxstenosen.

So grossen Werth auch die von Trendelenburg-Schrötter in die Praxis eingeführte Methode der successiven Dilatation hat, so genügt sie doch nicht für alle Fälle. Ganz ungenügend aber erscheint sie bei jenen sehr derben und starren, röhrenförmigen Verengerungen, die einestheils einer ossificirenden Perichondritis, Knorpelwucherungen und unnachgiebigen callösen Bindegewebshypertrophien, anderntheils dem Einsinken des Kehlkopfes nach Elimination ganzer Knorpel oder grösserer Knorpelstücke, constringirenden Narben und umfangreichen Verwachsungen ihre Entstehung verdanken. Fracturen der Knorpel und Schussverletzungen geben hiezu weniger Anlass, als bis auf den Knorpel dringende Ulcerationen bei Typhus und Syphilis. Die Mittheilungen von Heine, P. Bruns und Foulis, sowie Schüller bestätigen übereinstimmend nicht nur den eclatanten Erfolg der partiellen Resection, sondern auch die Nutzlosigkeit der Dilatationsmethode. Auch darin stimme ich Schüller und P. Bruns bei, wenn sie die Resection bei jenen Stricturen vornehmen, bei welchen zwar die successive Dilatation ausreichen würde, die Stimmorgane aber derartige Veränderungen erfahren haben, dass eine Phonation ohne Kunsthilfe unmöglich ist. Ohne den Werth der allmählichen Dilatation auch nur im mindesten bezweifeln zu wollen, kann ich doch, gestützt auf eigene Erfahrung, nicht verschweigen, dass diese Methode wegen ihrer unverhältnissmässig langen Dauer sehr oft die Kranken abschreckt und diese dann in kategorischer Weise rasche Abhilfe verlangen, zumal unendliche Geduld nicht eben Jedermanns Sache ist. Berücksichtigt man ferner, dass in Folge von mechanischen Hindernissen, die von F. Semon in einer ausgezeichneten Arbeit zum erstenmale ausführlicher beschrieben wurden, in Folge von Substanzverlusten und Narben

die Stimme sehr oft vollständig zu Verlust gegangen ist, so muss man unbedingt demjenigen Verfahren das Wort reden, das mit der Schnelligkeit auch die Möglichkeit der Wiederherstellung oder wenigstens Verbesserung der Stimme mittelst Einlegen eines Phonationsapparates verbindet.

Wenn ich ferner die Resection für angezeigt halte:

2) Bei jenen gutartigen Neubildungen, bei denen die Thyreotomie oder Laryngotomie indicirt wäre, diese aber wegen Verknöcherung der Knorpel und Gefahr der Knorpelfractur nicht ausgeführt werden kann, so bedarf dies wohl keiner weiteren Begründung.

Wenn ich aber endlich die partielle Exstirpation für angezeigt halte:

3) Bei jenen bösartigen Neubildungen, die bei circumscripter Insertion den Knorpel ergriffen haben oder bei flächenförmiger Infiltration auf eine Kehlkopfhälfte beschränkt sind, so muss ich ausdrücklich betonen, dass bis jetzt noch zu wenig Erfahrungen vorliegen, als dass diese Indication immer und überall stricte aufrecht erhalten werden könnte. Dass die theilweise Entfernung des Kehlkopfes insoferne günstigere Resultate gibt, als dieselbe den Gebrauch der natürlichen Stimme mittelst eines Stimmbandes ermöglicht und das trotz aller Verbesserungen immer noch lästige Tragen eines Phonationsapparates überflüssig erscheinen lässt, hat der von Billroth operirte Kranke sicherlich bewiesen. Ob aber die partielle Entfernung des Larynx zur Verhütung der Recidive genügt, und ob dieselbe doch nicht besser durch die Totalexstirpation ersetzt wird, muss, wie auch Schüller hervorhebt, erst die Zukunft lehren.

Eine Ausnahmestellung scheinen die derben Fibrosarcome des Kehlkopfes einzunehmen, da in manchen Fällen die Entfernung durch Thyreotomie* und wie ich selbst erlebt habe† sogar die endolaryngeal-galvanokaustische Methode genügte, definitive Heilung ohne Recidive herbeizuführen.

Für contraindicirt halte ich die Resectio laryngis:

1) Bei den einfachen dehnbaren Larynxstenosen, besonders bei den membranösen Verwachsungen der Stimmbänder oder anderer Kehlkopftheile.

Hier ist das Feld der successiven Dilatation, hier feiert die endolaryngeale Behandlung, Spaltung mittelst Messer oder Galvanokaustik, ihre schönsten Triumphe. Für den Fall aber, dass genannte Methoden nicht ausreichen, führt die Discision der Narben oder Entfernung hypertrophischer Schleimhautwülste auf laryngotomischem Wege sicher zum Ziele.

Die Resection des Kehlkopfes halte ich endlich für contraindicirt:

2) Bei Papillomen, auch wenn sie wiederholt recidiviren, und

3) bei jenen bösartigen Neubildungen, welche bei einseitigem Sitze benachbarte oder entferntere Organe in Mitleidenschaft gezogen haben.

Die Gründe hiefür sind dieselben, wie ich sie bereits früher gelegentlich der Contraindicationen der totalen Exstirpation auseinandergesetzt habe.

DISCUSSION.

Dr. Solis Cohen, Philadelphia:—I am afraid that there is a tendency to the operation being overrated, if we do not appreciate the usually miserable conditions of the patients, who have undergone it successfully, for there is an important difference between "recovery" and mere "survival after the operation."

Professor Caselli, Reggio Emilia: In the course of a year I have twice excised parts of the larynx, which were involved in large tumours of the neck;

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* Vergleiche P. Bruns, "Die Laryngotomie zur Entfernung intralaryngealer Neubildungen."

† Vergleiche meine Mittheilung im Bande xvi. des *Archivs für klinische Medizin.*

but my results have not been so happy as in the case I showed last year at the Congress at Milan. In one case there was an enormous myxomatous fibrochondroma of the hyoid bone and larynx; but the exhausted state of the patient led to his death in three days after operation. In the other case there was a diffused epithelioma of pharynx and epiglottis, involving part of the thyroid cartilage. This patient succumbed to acute œdema of the lungs, induced by the entrance of particles of food into the respiratory tract even before the operation. If I were to draw any conclusion from my own experience, I would be inclined to prefer complete to partial extirpation; or, at least, I would remove the whole of the thyroid cartilage even where a part of it seemed to be sound, and leave the cricoid only. My chief reason would be the liability to inflammation from rubbing of the anterior part of the remaining half of the larynx in contact with the cicatrix after the operation. This friction might easily induce a submucous œdema, which, spreading along the trachea, might cause suffocation, in spite of the presence of a tracheal canula.

Dr. Morell Mackenzie, London: Dr. Foulis' table seems to indicate a higher rate of success than that published by myself. I am glad to see this, but it must be remembered that many unsuccessful cases may not be recorded. Comparing the opinions of Drs. Foulis and Schech, I find that they differ as to the adoption of extirpation in recurrent papilloma. I would in this respect agree with the latter rather than the former, who recommends the operation. It ought to be remembered, also, that the condition of a patient after extirpation of larynx is usually one of great misery. The case of the American patient has certainly made a great impression in this country, and must have made most laryngoscopists less disposed to recommend the operation. On the other hand, we must not forget the case of Bottini, in which a patient has continued to act as a postman, walking eight miles a-day for several years since the operation. With reference to the position of resection, I am inclined to agree with Dr. Schech, in opposition to Dr. Foulis, that there are many cases in which resection can be performed and extirpation avoided.

Professor Czerny, Heidelberg: The question of extirpation of the larynx presents such difficulties that I have come here not to teach but to learn. Fully as I recognize the right of existence of the sceptical party which has to separate the chaff from the grain, yet I must pertinently claim for my less sceptical party the recognition that we ask, quite as conscientiously as the other side, in every individual case: "What would you wish to be done unto yourself under the circumstances of the case?" If we look at Dr. Foulis' tables, it is true that we should come to the conclusion that the extirpation of the larynx was but of little value, only five of all who had been operated on being alive now. But let us be true to ourselves, and confess that of all patients operated on for carcinoma but few have been permanently cured. As long as we do not possess a treatment as efficient against malignant tumours as the knife, we really must be consistent, and not refuse to the patient, who is irreparably lost through his laryngeal carcinoma, the possible advantage of the operation. As to the permissibility of the extirpation of the larynx, the state of the patient after the operation is, it is true, of decisive importance, and we have just heard that an American patient was very, very miserable after its performance. I have performed the operation three times on men, and do not consider it so very dangerous; but the after-treatment is one of the most difficult tasks that could be given to the surgeon, and the functional results vary very much according to the stage of the disease. But even in my first two cases, in which I was only able to operate late, as the diagnosis was for a long time uncertain, yet there

was the advantage that the pains, which before the operation rendered the taking of food almost impossible, ceased afterwards. If it is necessary to remove much skin, the circatricial contraction is not sufficient to cover completely the space round the artificial larynx; under these circumstances, taking food, especially fluid, is often impeded. In my last case, which unfortunately is only of three months' date, the state of affairs is so favourable, and the artificial vocal apparatus answers so admirably, that the patient is about to resume his duties as a superior judge (*Oberlandesgerichtsrath*). Let us hope that he may fulfil them for a long time!—The question, in functional respects, as to the preservation of the epiglottis, is not yet decided. The results vary very much according to the case and according to the patient's individuality, which has the greatest influence upon the functional success. For all this it follows that the whole question is a most difficult one, and which will not be ripe for decision for a long time to come. I believe that extirpation of the larynx, apart from other indications, is demanded as soon as the diagnosis of a malignant new formation, be it by means of the laryngoscope or by microscopic examination of removed particles, is attained, and as soon as it becomes visible that after failure of other remedies the malady irresistibly progresses, and unquestionably endangers the life of the patient.

Dr. Felix Semon, London: I fully feel the difficulty of speaking in an adverse sense immediately after the man who has first practically shown the possibility of removing the larynx during life without killing the individual. But I cannot help thinking that in the whole question one important fault is committed by a good many members of the profession—viz., that of confounding the two very different ideas of the "possibility" and of the "justifiability" of an operation. I am astonished to hear that both Dr. Foulis and Prof. Czerny simply take it for granted that as soon as the diagnosis of carcinoma of the larynx is established, under all circumstances extirpation should forthwith be proceeded with. Now, I cannot help asking myself, when looking at Dr. Foulis' own tables, are the results hitherto obtained in cases of carcinoma, and recorded in these tables, really of so brilliant a character as to justify the laying down such a dogmatic rule? It will be found there that of the twenty-six cases in which total extirpation of the larynx has been performed for carcinoma, not less than fourteen died —one may fairly say from the immediate consequences of the operation itself— *i.e.*, within a fortnight of the operation. Of the remaining twelve, nine died from recurrence, one having survived just nine months, and the majority having died from within four to six months. The fate of one is unknown after the seventh month, and only two are alive at the present moment; but it must be remembered that one was operated upon on the 30th of April, the other on the 12th of May of this year; thus, in neither of the two only surviving cases does the operation date back more than three months. Are these results encouraging? And especially when compared with those of tracheotomy in the same complaint in which statistics show that the average duration of life after the operation is rather more than a year? Moreover, how different is the life after tracheotomy from that, according to almost all descriptions, miserable existence after extirpation of the larynx! I know what objection will be made to these conclusions—viz., that the majority of the cases hitherto operated on were already in so late a stage of the disease that no general conclusions ought to be drawn from these instances. But I am ready to answer this objection at once. Who, in a large proportion of these cases, will take upon himself to diagnosticate early and positively carcinoma; and who again, if carcinoma is diagnosticated, will say positively whether it is in an early or more advanced stage?—With regard to the first question, I wish to say that the differential diagnosis of carcinoma from tertiary syphilis, and its consequences,

is often really not the easy thing one might be induced to believe from the convenient descriptions in the textbooks. Not only is the laryngoscopic differential diagnosis often exceedingly difficult for a long time, but I wish to state here that it is necessary to be guarded in making the diagnosis and giving out a prognosis *ex juvantibus;* for having had the opportunity of seeing and carefully observing an unusually large number of cases of laryngeal and œsophageal carcinoma, in which I have given iodide of potassium to avoid any possible error, I am able to state distinctly that in a large proportion of them (though not in all) the administration of this drug has produced a subjective improvement, and in some of them apparently even a temporary arrest of the progress of the disease, for a period varying from eight days to four weeks. With regard to the second question—viz., "Is it always possible to decide whether the carcinoma is in an early or advanced stage—*i.e.*, has or has not an infection of the neighbouring parts already taken place?"—I cannot do better than communicate a case of carcinoma which is still under my observation, and which gives much subject for thought. It is that of a gentleman aged sixty, who had twenty years ago secondary syphilis, and who began to suffer from his throat in October, 1880. The diagnosis remained for a long time doubtful between specific perichondritis on the one hand and carcinoma on the other, iodide of potassium yielding by no means the decisive results which are generally anticipated from its use. Particular attention was paid from the very beginning to the condition of the lymphatic glands, which were found in repeated examination not to have undergone any perceptible change. It was not till the beginning of March, 1881, that the diagnosis of carcinoma could be actually established, at this time the posterior cervical lymphatics becoming slightly hardened, but not perceptibly enlarged. The question of extirpation of the larynx was carefully taken into consideration, and a consultation was held with Sir James Paget, who entirely corroborated the diagnosis including the state of the lymphatics, but who was as little in favour of extirpation as myself. The posterior surface of the cricoid cartilage, and with it the muscles opening the glottis, becoming affected at that time, I had to perform tracheotomy on the 9th of March; *exactly one week after the operation* a swelling of the size of a hazel-nut, which quickly increased, and was painful on touching, appeared on the right side of the neck immediately behind the posterior belly of the sternomastoid muscle!—If in this case extirpation had been performed instead of tracheotomy, there would have been a recurrence within one week after the operation!—This case, I think, is sufficiently instructive to show the difficulties of deciding at an apparently early date whether constitutional infection has not yet taken place. In conclusion, I desire to say that I have no theoretical objections against the operation as such, and that I agree with many of the indications laid down by my friend Schech, but that I consider it a duty to protest against its indiscriminate recommendation in *all* cases of carcinoma, a recommendation which, I think, is with difficulty theoretically justifiable, and which is certainly practically not justified. I wish to protest still stronger against the operation in cases of recurrent papillomata, a subject on which I shall have to say more on a future occasion.

Prof. Burow, Königsberg: In my opinion it is better not to perform total extirpation on patients with carcinoma of the larynx, but if the case be a suitable one, to make endo-laryngeal, even if only partial, excision, and to tracheotomize if dyspnœa makes its appearance. Such patients live on the average two and a half years from the beginning of the affection, and one and a half after tracheotomy, and are frequently able to follow their vocation for a considerable time. If the operation of extirpation is to be performed at all in

such cases, it certainly ought to be done at a very early period; but will we, in such an early period, when the symptoms are still slight, get the patients' permission, unless we tell them the malignant nature of their affection? By doing so, we make the rest of their existence miserable, and deprive them of the desirable self-deception in which we can keep them for a long time if we only temporize—*i.e.*, tracheotomize. These are my present views, but it is, of course, possible that new observations in coming years may lead me to modify them.

Dr. PROSSER JAMES, London: The question of operation is to be considered in reference to—(*a*) the disease, (*b*) the patient. In malignant disease it is clear that the earlier the operation be undertaken, the greater is the prospect of success; in recurrent growths we should delay as long as possible. Although some have advocated the operation in benign cases, I have not yet seen an example in which I could bring myself to recommend it. Recurrence of growth can be met by repetition of less serious procedures. As to the patients, much depends upon their individuality. Up to the present the patients to whom I could recommend the operation have either declined the risk or postponed the decision until complications have arisen to forbid it.

Prof. LEFFERTS, New York: The one American case of extirpation of the larynx has been alluded to several times to-day as the extreme example of the bad moral effects that may follow the operation. The main reason for the patient's subsequent discomfort, not unusual however in like cases, was the impossibility of closing the large defect in the neck, by any form of artificial apparatus, so as to permit of perfect deglutition. The moral effects of this operation was not as bad as has been represented; the patient lived cheerfully for some months, naturally however discouraged by a result (in deglutition) which he had hoped would be better. The other facts of the case are known to you. He did not, let me say, commit suicide.

Dr. JOHNSON, Chicago: The patient just referred to was under my care. I performed cricotomy. The canula gave him some discomfort, and he was extremely anxious for a radical cure. I refused, after consultation, to perform extirpation of the larynx. The operation, however, was performed elsewhere, and I heard from members of his family that he was in a state of great despondency, but I do not believe that he ever attempted suicide.

Dr. FOULIS, Glasgow: With regard to the class of cases of recurring papillomata, it will be, of course, necessary to be quite sure that the recurrence is complicated by sarcomatous elements; and therefore one would not think of extirpation until signs of such complication made their appearance. Dr. Semon's remarks as to the relation of the desirability of any operation are, of course, true, but in every operation these considerations occur to the mind of the operator, and extirpation is no exception to the rule. In each case I am accustomed to tell the patient the whole facts, and let him decide. The American case, about which so much had been said, is, I think, not in court, for the advanced state of the disease, and the great age of the patient, make it a very unfair case on which to found an opinion in other and more favourable cases.

Die galvanokaustische Methode in Nase, Schlund und Kehlkopf.

Prof. VOLTOLINI, Breslau.

Die von Middeldorpf in Breslau erfundene Galvanokaustik hatte Anfangs noch nicht diejenige Verbreitung gefunden, die sie verdient; zum Theil war hieran Schuld die Construction der Batterie von Middeldorpf, welche mit den stärksten Säuren gespritzt wurde. Ich kann wohl, ohne unbescheiden zu sein, sagen, dass meine neue Batterie viel dazu beigetragen, dass die Galvanokaustik nunmehr eine grössere Verbreitung gefunden und habe ich diese Batterie so eingerichtet, dass sie auch zum Inductions-Strome, zum constanten Strome, zur Electrolyse und zum Electromagnetismus verwendet werden Rann.

Die Galvanokaustik habe ich in den genannten drei Höhlen nur in der Form der galvanokaustischen Schlinge und des Galvanokauter in Anwendung gebracht, sehr selten als Porzellanbrenner. Letzterer, resp. das Porzellan kühlt sich zu langsam ab und man kommt deshalb in Gefahr beim Zurückziehen des Instrumentes nach dem Brennen die gesunden Theile zu verbrennen, wenn der Raum nicht weit genug ist.

Die vielen unzweckmässigen Batterien und Instrumente, die bis jetzt in der Welt circuliren, verdanken ihren Ursprung lediglich den Mechanikern oder Instrumentenmachern, ohne dass diese sachverständige Aerzte bei der Construction zu Rathe gezogen haben. Der Mechanikus allein hat aber keine Ahnung von der zweckmässigen und richtigen Construction der Batterie und Instrumente, wie sie der Arzt nöthig hat. Daher die plumpen Operations-Instrumente, unpraktischen Batterien mit Galvanometer—eine unnütze Spielerei u. s. w.

Es ist ein grosser Irrthum, wenn man glaubt, dass die Galvanokaustik an sich vor Blutungen schütze; im Gegentheil: man kann durch dieselbe lebensgefährliche Blutungen hervorrufen und es soll namentlich der Zweck dieses Vortrages sein, zu zeigen, wie man mit Galvanokaustik operiren soll, um Blutungen zu verhindern und die grossen Vortheile der Galvanokaustik auszubeuten. In der Nase ist die Galvanokaustik bisher durch kein anderes Mittel zu ersetzen, sowohl bei Nasen-Polypen als bei Tumoren, Geschwüren, &c. Bei Nasen-Polypen reicht die kalte Drahtschlinge durchaus nicht aus, sondern man muss mit der Galvanokaustik auch den Boden zerstören, auf welchem die Polypen sassen. Wenn die Polypen sehr massenhaft in der Nase vorhanden sind, so erleichtert man sich die Operation sehr, wenn man zunächst nur brennt, d. h. mit dem glühenden Kauter die Polypen zerstört. Ist die Nase weit, wie das gewöhnlich der Fall ist bei solcher Massenhaftigkeit der Polypen, so kann man auch den Porcellanbrenner in Anwendung bringen. Wartet man nach diesem Brennen 1—2 Tage, so sind die Polypen so morsch geworden, dass man ganze Convolute mit der Schlinge mit Leichtigkeit hervorbringen kann und hat mit keiner Blutung zu schaffen.

Bei grosser Schwellung der Nasenmuscheln, wie sie besonders an der untern Muschel und vornehmlich an deren hinterem Ende vorkommt, giebt es kein einfacheres und sichereres Mittel, als das Bestreichen derselben mit dem glühenden Galvanokauter. Bei dieser Operation aber, so wie bei der mancher Nasenrachen-Tumoren (Fibrome) muss man nach bestimmten Grundsätzen verfahren, wenn man nicht eine lebensgefährliche Blutung hervorrufen will. Die Nichtbeachtung dieser Regel hat Veranlassung gegeben, hier der Electrolyse vor der Galvanokaustik einen Vorzug einzuräumen; aber die Electrolyse ist viel langwieriger, umständlicher, unbequemer für den Arzt und Patienten, da das Operations-Instrument mindestens 10—15 Minuten im Rachen des Patienten still gehalten werden muss; ausserdem erreicht man auch mit der Galvanokaustik in 5 Minuten mehr, als mit der Electrolyse in 5 Tagen. Man muss mit der Galvano-

kaustik nach folgenden Regeln verfahren, wenn man einen Tumor vor sich hat, welchen man für sehr blutreich hält (was bei gewöhnlichen sogenannten. Schleimpolypen nicht der Fall ist) :—

1) Man dringe niemals mit der Spitze des Kauter direkt in den Tumor hinein, weil sonst ein Blutstrom hervorstürzen kann, welcher den Tod des Patienten herbeizuführen vermag.

2) Man bestreiche solche Tumoren also nur mit der flachen Klinge des glühenden Kauters und zwar in der ersten Sitzung nicht zu häufig. Man bringe, so zu sagen, durch dieses Bestreichen den Tumor erst zur Kochung, Gerinnung, was nach der Bestreichung nach mehreren Tagen eintritt, alsdann kann man dreister vorwärts gehen, d. h. aber nur mit der flachen Klinge.

3) Aber auch selbst, wo man blos die Fläche der Klinge wirken lässt, gebrauche man niemals zu starke Glühhitze, nicht Weissglühhitze, weil diese auch bei der flachen Klinge zu tief eindringt; deshalb wähle man bei frischer Säure die Combination der Elemente, welche schwächeres Glühen erzeugt. Da beim Betupfen der Kauter leicht an den Tumor anbackt und man beim Zurückziehn des Instrumentes leicht Stücke des Tumor abreisst und dadurch ebenfalls eine Blutung erzeugen kann, so vollführe man das Zurückziehn in dem Momente, wo man das Instrument wieder verglühn lässt, es löst sich dann vom Tumor leichter ab.

Bei Operationen im Kehlkopfe ist Galvanokaustik bis jetzt ebenfalls nicht zu ersetzen. Ich spreche hier nicht von der Entfernung gewöhnlicher Polypen, diese mag Jeder nach seinem Geschmack, nach seiner Methode entfernen, aber es giebt Gewächse, wo die Galvanokaustik nicht zu ersetzen ist. Diese sind jene flächenhaften Wucherungen über einen grossen Theil der Innenfläche des Larynx; wer Aetzmittel anwenden will, kann den Patienten in Gefahr bringen, weil diese zerfliessen und ihre Wirkung nicht begrenzt werden kann. Ich bin nach Erfahrungen, die ich gemacht habe, auch der Meinung, dass die Galvanokaustik allermeist auch die Dilatations-Instrumente (Bougie, Röhren) bei Stenose des Larynx entbehrlich machen kann, ja ihnen weit vorzuziehn ist. Die Dilatations-Instrumente geben selten eine volle Sicherheit, dass die Stenose nicht wieder eintritt—und dann manchmal plötzlicher Tod. Man vergleiche hierüber die Abhandlung von Sceparowski.* Ausserdem wird durch die Bougies das noch Gesunde des Larynx schwer geschädigt, wie ich jetzt eben einen solchen Fall in Behandlung habe und von den Bougies zur Galvanokaustik übergegangen bin. Wenn eine Schwellung von einer Seite des Kehlkopfes in das Lumen hineinragt und die andere Seite noch relativ gesund ist, so giebt diese Schwellung dem Bougie oder der harten Röhre immer beim Einführen eine Direction nach der gesunden Seite und diese wird jedesmal mitgetroffen und schwer geschädigt, während bei dem Galvanokauter ich eben nur die kranke Seite treffe und verkleinere. Mit dieser brenne ich die Schwellung oder Schwiele, fort, bis diese Seite der andern gleich ist, oder wenn die Schwiele sich auf beiden Seiten befindet, so würde hier zwar die Bougie oder Röhre nicht jene vorhin angegebene Gefahr mit sich bringen, die Galvanokaustik nimmt aber sicherer und dauernder die Schwellung hinfort, und zwar geschieht dieses Alles ohne jede Blutung, während Scarificationen durch das herabfliessende Blut den ohnehin nach Luft ringenden Patienten noch mehr belästigen.

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* Przeglad Ckarski, 1880, No. 14–20, *Centralblatt für Chirurgie*, No. 26; *Monatschrift für Ohrenheilkunde*, &c., No. 3, 1881.

Galvanocaustic Method in Nose, Pharynx and Larynx.

Dr. J. SOLIS-COHEN, Philadelphia.

While not using the galvano-cautery with anything like the frequence with which it is employed by many of my *confrères*, I have used it sufficiently to test its comparative utility in the treatment of various affections of the nasal, pharyngeal, and laryngeal cavities. My own resort to the galvano-cautery is almost entirely confined to one or other of two purposes: first, to destroy tissue; and second, to produce an alterant effect upon the nutrition of deep-seated tissues by superficial cauterization of the overlying mucous membrane.

There is little doubt in my mind that the galvanic cautery is often unnecessarily employed to perform work which can be more easily accomplished—and more satisfactorily, too, for that matter—by less severe means.

In the Nose.—Complete or partial stenoses of the nasal passages, whether due to hypertrophied mucous membrane, sub-mucous infiltrations, or morbid growths of various kinds, furnish frequent occasion for the use of the galvano-cautery. Hypertrophied tissue, when it cannot be subdued by the ordinary application of astringents, or more or less systematic compression with tents of compressed sponge or tubes of laminaria, or progressive dilatation with metallic bougies, may sometimes be forced to undergo absorption by superficial scoring of the mucous integument.

Even scoring deep enough to destroy linear portions of the mucous membrane itself, though this effect is by no means necessary, will rarely be productive of harm; because the cicatricial tension of the adjacent surfaces will tend to draw the membrane more tightly upon subjacent tissue, and thus keep up a salutary compression. Care is necessary in the execution of these procedures to avoid touching sound tissues with the cautery itself, or even with the wires, insulated though they may be, to which the platinum cautery is attached. Disagreeable burns and permanent disfigurement may be the penalty for neglect of this precaution.

While acknowledging the value of the galvanocaustic loop in the removal of pedunculated neoplasms from the nasal passages, or even hypertrophied masses of tissue that protrude into these cavities neoplasm-like, I am satisfied that resort to it is unnecessary; and that with a little care, and a little more time occupied in the operation itself, these masses may be removed with the unheated wire with equal facility, with less pain, with much less hazard of subsequent hæmorrhage, and without the almost inevitable cauterization of adjacent healthy tissue.

It too often happens that the incautious use of the galvano-cautery in the nasal passage is followed by inflammation not only of the nasal tract itself, but of the nasal duct and the conjunctival mucous membrane. Thence the inflammatory process may even extend to the eyelid, the cheek, and the face. Severe erysipelas has likewise followed the manipulation, involving not only the structures just named, but even intercranial tissues.

Infiltrations of the posterior surfaces of the vomer, so often occluding the posterior nares, are sometimes removable by means of the galvano-cautery more easily than by any other surgical procedure. The galvano-cautery blade should be introduced by the nostril and passed along the septum until it reaches the exuberant tissue, when, incandescence being excited, it may be pushed through this tissue into the pharynx, thus detaching a portion. Or the flat blade may be pressed upon the growth, so as to destroy it by actual cauterization. The position of the instrument should, wherever practicable, be verified in the rhinoscopic image before the incandescence is excited. The

manipulation described, though often difficult, is much easier of execution, and far more accurate, than when the attempt is made to attack the growth by a curved cautery introduced through the mouth.

In the Pharynx.—The galvano-cautery has been used freely in some portions of the United States at least, for the purpose of destroying hypertrophied adenoid tissue at the vault of the pharynx. Having always been able to free this region from this exuberant tissue by means of cupped-shape cutting forceps, I have never had any occasion to resort to the cautery for the purpose. The reaction, as I have heard, is sometimes equally severe with that encountered in like operations within the nasal passages.

Naso-pharyngeal growths, especially fibromas, appear to me to find in the galvano-caustic loop the safest and most satisfactory method of removal. The advantage of the heated wire over the cold one in these operations is not only the greater rapidity of the operation, and the consequent avoidance of inspiration of the fetid exhalations of the decomposing masses during the period—often several days—which is required for the wire to cut through the base of the growth; but the searing of the attached surface of the growth leads to a destructive action, which is apt, in some instances, at least, if not in many, to involve the entire remnant of the neoplasm, which is eventually discharged by slough. When we recall the dangers of imminent death, in unfortunate cases of naso-pharyngeal tumour of unknown extent, wrenched away with violent tugs of the forceps, the galvano-cautery seems to point out a means of security from such untoward complications.

In those cases of folliculous pharyngitis which seem to require absolute destruction of the little masses of enlarged follicles, which have resisted or are likely to resist all treatment less severe than their actual demolition, the galvano-cautery certainly presents the most ready, effectual, and least annoying method for accomplishing that result. At periods varying from three to five or more days, successive cauterizations of from two to five of these little masses can be made without producing pain of any consequence at the moment, or sufficient discomfort of any kind to interfere with the immediate resumption of ordinary employment. The cauterized masses will slough out in the course of a few days, and as this process continues with each successive batch of them, a few weeks will suffice to effect permanent riddance of the source of long-protracted suffering.

Slight clefts of the palate may sometimes be united by cauterization of the angle of the cleft. As soon as the adhesion is firm, cauterization of the edges immediately below is effected in the same manner. When this adhesion becomes firm, another cauterization is made immediately below it, and these processes are continued until the parts become adherent along the entire line.

Perforations of the palate can sometimes be closed up in a similar manner by superficial cauterization with the galvano-cautery.

Hypertrophied tonsils may either be excised with the loop or burned down with the surface cautery. When time is not an object and the patient can remain a number of weeks under treatment, the latter operation is, in my opinion, much to be preferred.

The difficulty of securing a wire loop around the tonsil, and of protecting the tongue, lips, and angle of mouth from cauterization, either by the heated wire or even the heat of the insulated portion of the electrode, and the absolute necessity of at least one assistant in order to perform the operation effectively, often render the procedure an awkward one, and unsatisfactory as a surgical manœuvre. The cauterization of the surface, on the other hand, is comparatively easy, and can be readily performed without the presence of an assistant.

The broad surface of a flattened wire can be pressed over successive por-

tions of the surface of the tonsil at each interview, and the process be repeated until the organs are burned down to the most suitable shape and dimensions. Enlarged glands at the base of the tongue sometimes require destruction, for which purpose the galvano-cautery point may be used; but great care is requisite to avoid cauterizing the undiseased tissue of the tongue on one side and the epiglottis on the other.

Retro-pharyngeal tumours, if not extending into the cervical region, may be removed by the galvano-cautery, after due exposure of the morbid mass, by means of an incision through the overlying mucous membrane and other investments.

Extensive tumours in the palate, or in the palate and pharynx, when the pharyngeal attachments are apparently circumscribed, may be removed with the galvanocaustic knife without risk of hæmorrhage, such as interferes so seriously with due performance of the operation by cutting instruments. The secondary hæmorrhage, however, is apt to be greater and more imminent, and the presence of the sloughing tissues renders it difficult to keep the patient's health from undergoing deterioration during the after-treatment.

Pharyngeal stenoses, due to adhesions between the palate and the pharynx, often tempt the use of the galvano-cautery: but the difficulty of keeping the parts from apposition usually prevents success from following it.

In the Larynx.—Small neoplasms which evade removal with forceps may sometimes be advantageously cauterized with the galvano-cautery. Web-like cicatrices, such as follow section of the larynx from the exterior, are more readily severed by the galvano-cautery than by any other means; but it behoves the manipulator to be sure of his hand, his instrument, and his patient. Otherwise, in the spasmodic action which almost inevitably ensues before the part has been sufficiently burned, he will be sure to do injury to sound tissue.

Laryngeal stenoses of cicatricial origin are more likely to yield to galvanocaustic treatment than to incisions, although the tendency to re-cicatrization is often so great as to render the treatment practically useless.

In performing these operations it is best to do but little at a time, and to interpose frequent dilatation so as to prevent re-cicatrization as far as possible.

Conclusions.—1.—The galvano-cautery is often used unnecessarily.

2.—The galvano-cautery is often inferior to the cold wire in the treatment of intra-nasal neoplasms and neoplasmic-like hypertrophic protrusions of normal tissue.

3.—The galvano-cautery is valuable both as escharotic and alterant in hypertrophied nasal mucous membrane impeding respiration.

4.—The galvano-cautery is unnecessary in the treatment of hypertrophied adenoid tissue at the vault of the pharynx.

5.—The galvanocaustic loop presents one of the safest and most satisfactory appliances for the removal of naso-pharyngeal growths and of pharyngeal tumours, for the destruction of masses of hypertrophied follicles in chronic folliculous pharyngitis, and for the destruction of enlarged follicles at the base of the tongue, and in adjacent localities.

6.—Hypertrophied tonsils may be readily burned down with the surface cautery; the inconveniences attending excision with the wire loop render the method inferior to ordinary excision with cutting instruments.

7.—Extensive tumours involving the palate, or the palate and the pharynx, are often subject to satisfactory removal with the galvano-caustic knife.

8.—The galvano-cautery is inadequate to the satisfactory treatment of pharyngeal stenosis.

9.—Small laryngeal neoplasms, readily reached, may be destroyed with the galvanocaustic point.

10.—Web-like cicatrices between adjacent structures are best destroyed by the galvano caustic knife, and with less certainty of subsequent re-adhesion.

11.—In the employment of the galvano-cautery great care is requisite to avoid cauterization of healthy tissue adjoining the diseased structures.

La méthode galvanocaustique dans le nez le pharynx et le larynx.

Professor CADIER, Paris.

Depuis que la découverte de la pile sécondaire de Planté a permis de graduer d'une façon mathématique l'élévation de température des fils de platine du galvano-cautère, j'ai fait de nombreuses applications de cet instrument pour le traitement de différentes affections de l'appareil vocal. Je me propose de lire au Congrès de Londres le résumé de mes observations à ce sujet. L'analyse de ces observations nous permet de tirer les conclusions suivantes, que je vous adresse comme résumé de ma communication.

Conclusions.—1.—Dans la période tertiaire de la laryngite syphilitique, lorsqu'elle est caractérisée par des végétations papillaires polypiformes assez nombreuses, j'ai vu employer et j'avais recours autrefois à l'arrachement avec la pince, suivi d'une application de caustique (nitrate d'argent ou acide chromique) ; mais, malgré cette médication, les végétations répullulaient rapidement. En présence de l'insuccès de cette médication, j'ai employé la cautérisation avec le galvano-cautère, mais en ayant soin de ne porter le fil de platine qu'à la température du rouge sombre. Par ce moyen j'ai obtenu le double avantage d'arrêter immédiatement l'hémorrhagie occasionnée par l'arrachement à la pince, et de détruire en même temps les végétations trop peu saillantes pour être saisies avec la pince. Sous l'influence de ce traitement j'ai pu obtenir dans trois jours une guérison assez rapide de ces végétations. L'une de ces trois observations a été publiée et lue à la Société de Médecine.

2.—Dans l'hypertrophie chronique des amygdales, au lieu d'avoir recours à l'ablation avec l'amygdalotome, qui peut quelquefois provoquer des accidents graves, j'emploie une igni-puncture galvano-électrique, en ayant soin d'enfoncer ma pointe de platine de 4 à 7 millimètres environ dans le tissu de l'amygdale, et de porter cette pointe à la température du rouge blanc. En pratiquant à chaque séance 4 à 6 pointes d'igni-puncture, il suffit le plus souvent, dans les cas ordinaires de deux ou trois séances pour arriver à diminuer considérablement le volume de l'amygdale hypertrophiée. Cette opération n'est pas douloureuse ; j'y ai eu recours dans quatorze cas chez des enfants de huit à quinze ans. Dans dix cas j'ai obtenu un succès complet, et dans quatre cas il n'y a eu qu'une résolution partielle de l'amygdale.

3.—Dans les granulations volumineuses du pharynx, souvent les caustiques ordinaires ne donnent aucun résultat bien appréciable, j'ai alors recours à des cautérisations localisées avec la pointe d'un galvano-cautère. Ces granulations sont ainsi détruites instantanément, et en ayant soin de ne toucher qu'avec legèreté la partie la plus centrale de la granulation, on peut répéter un assez grand nombre de fois cette opération, sans craindre de déterminer une inflammation trop mûre. A la suite de cette cautérisation, il se produit une petite ulcération qui se guérit rapidement pendant que la totalité de la glande paraît s'atrophier. Sept ou huit jours après cette cautérisation, on n'aperçoit plus qu'une petite cicatrice blanchâtre, et la granulation a entièrement disparu.

4.—Dans les polypes du nez, lorqu'ils ne sont pas trop volumineux ni trop profonds, je les enlève avec l'anse galvano-caustique qui présente l'avantage

d'éviter les hémorrhagies. Pour introduire cette anse j'ai fait construire à Aubry une pince spéciale que je me propose de présenter au Congrès. Lorsqu'il m'est impossible d'introduire l'anse galvanique je pratique l'arrachement avec la pince, mais en ayant soin de pratiquer ensuite une cautérisation galvano-électrique qui arrête l'hémorrhagie et enlève les polypes d'une façon beaucoup plus complète et de plus présente le grand avantage de rendre les récidives beaucoup moins fréquentes.

Galvanocaustic Method in Nose, Pharynx, and Larynx.

Mr. Lennox Browne, London.

The large number of contributions offered on this subject is sufficient evidence that the galvanocaustic treatment is largely employed, and the general tone of the abstracts shows also that its value is pretty generally recognized. Except on one point—that of its application to the larynx, trachea, and œsophagus — differences are essentially those of individual experience, but it is just on these little matters of detail that success in my opinion depends. Having regard to the large amount of work still before the section, I have reduced my paper to the smallest limits, and will content myself with stating, in the briefest terms, the conclusions to which I have come. I am entirely with Dr. Solis Cohen that the galvano-cautery is inferior to the cold wire in the treatment of intra-nasal polypi and other neoplasms, though I have only come to this conclusion within the last year, for it is certain that the cold wire can be adapted more accurately to the base of a polypus, and the pedicle removed more completely by a cold wire snare, evulsion being slowly performed, not suddenly or with a jerk, than is the case with the galvanocaustic loop. If the latter be employed, connection should not be made until the growth is nearly cut through, otherwise strangulation will be imperfect, only partial removal will be effected, and a greater risk of hæmorrhage will occur. For this plan of treatment it is also necessary to have some kind of hook to draw down the polypi, such as Dr. Thudichum has to-day described. It is to be regretted that this author has not figured and detailed these instruments, to which he justly attaches importance, in his various communications to the public on the merits of his operation. For the treatment of non-pedunculated or false growths due to hypertrophy of the normal tissue I give preference to the cautery, on this point differing from Dr. Cohen, as I do in reference to its use for destruction of hypertrophied adenoid tissue at the vault of the pharynx, for which condition I prefer the cautery as less painful, more thorough, and less likely to lead to hæmorrhage than either forceps or curette. In these cases I do not employ a loop, but a porcelain point, and apply the cautery with considerable friction against the surface to be reduced. We are all agreed, I think, as to its value as an escharotic and alterant in all conditions of ulceration of the nasal mucous membrane, as well as in those in which the secretion is altered, and in my experience I have found the method equally valuable in those cases in which the secretion was excessive and limpid as in those in which it was inspissated and retained, probably because the latter is but an advanced stage of the same pathological condition. In all such conditions I agree with Professor Voltolini that the galvano caustic is *the* method *par excellence*. Professor Voltolini has spoken of the great importance of the thorough excellence and efficiency of a battery, and this is a point on which too much stress cannot be laid. In my battery I have always employed a foot con-

nection, so as to leave the hand at liberty, and at the same time to keep so important a matter within my own control. The foot-piece I formerly employed was in the course of one of the cords, and often acted imperfectly on account of the unnecessary amount of resisting force caused by the distance of the connection from the plates. I now employ a direct connection, much more effective and equally simple. Another point is to have the instruments as delicate as possible, and the cords pliable. In these matters I think I have succeeded in obtaining something like perfection; and I have to thank Mr. Coxeter for the great pains he has taken to act on my instructions in these respects. Of the form of battery, I certainly prefer, on account of convenience and economy, the Bichromate. Professor Voltolini has spoken of the question of hæmorrhage, and by the abstract, I see that he considers "the belief that the galvanocaustic method, *per se*, prevents hæmorrhage is erroneous." I think that, provided the cautery power be properly regulated, there is no fear of hæmorrhage, and the only way to ensure regularity is to employ a rheostat to measure exactly the heat of the wire. All danger of hæmorrhage arises from having the wire too hot—a black heat often answers for all that is required; a dull red heat is seldom needed, and by me never exceeded; a bright red heat is quite unnecessary, and anything like white heat absolutely to be avoided as dangerous. Another caution, not noticed by any of the contributors to this subject, but one of considerable importance, is that purulent median otitis is sometimes set up as a result of galvano-cautery in diseases of the nose. The following are the measures I observe for prevention of this complication: (1) To have as little heat as is absolutely necessary; (2) To use ivory nasal specula, which form non-conductors; (3) To syringe the nostrils with a rather strong solution of carbonate of soda directly after application of the cautery, and then to apply oil on wool to the nostrils so as to keep the air from the charred surface; and (4) To apply, in case pain is complained of, to the ears some warm atropine drops. In case of continuance of this pain, the ears should be examined and watched carefully, and a puncture of the membrane be made without delay if fluid be seen in the tympanum. This accident of extension of inflammation has three times occurred to me, and in two it has been necessary to perforate the membrane. In all, however, no permanent injury has resulted. It is mentioned because no good is done to any operation by ignoring risks against which, being forewarned, the surgeon may be forearmed. Not to make this paper tedious, I would say that I agree with all that has been said as to the value of the galvano-cautery in ulcerations in the pharynx and palate; but while I would never employ it for enlarged tonsils, as an unnecessarily tedious and painful substitute for excision by guillotine, it is of great value, as pointed out by Dr. Cohen, for destruction of diseased follicles in unenlarged or atrophied tonsils, and I employ it in cases of enlarged papillæ of the tongue and enlarged veins. In the latter condition, especially whether of pharynx, base of tongue, or epiglottis, it is invaluable, and in my opinion superior to every other method. For convenience and efficiency, it certainly surpasses electrolysis, of which I have but a limited experience. Its great claim over the actual cautery is that the instrument can be introduced and withdrawn cold. The same advantage holds good over the Paquelin or other form of thermo-cautery. Moreover, the after-pain of galvano-cautery is, in my experience, much less than either of these methods, certainly much less than in the case of acid nitrate of mercury, or nitrate of silver, in which there is diffusion of the caustic and unnecessary irritation of healthy surrounding tissue. I have employed galvano-cautery in one case of pharyngeal tuberculosis with benefit, and in one case of lingual tuberculosis with negative result. I have often used it in malignant disease of the epiglottis, and in one case of lupus, but have never yet ventured to apply it lower in the larynx, nor beyond

the upper limit of the superior constrictor of the pharynx. I have not yet employed it, nor am I inclined to recommend it for tracheotomy. In conclusion, while without galvano-cautery in diseases of the nose, pharynx, mouth, and tongue, I should feel deprived of, at least, one-half my power to help the conditions for which I use it, I have a strong conviction that were I to employ it in such regions as the larynx below the epiglottis, or to the pharynx below the same level, or the œsophagus, I should introduce into my practice a new and a grave element of danger.

The Actual Cautery in Certain Forms of Pharyngeal Disease.

Dr. Foulis, Glasgow.

In 1877* I published the results of my experience of the use of the actual cautery in chronic thickening of the pharynx in thirty-five cases. I now bring before you the further experience gained in treating over two hundred cases by this means. This method of treatment was suggested to me by the paper on the galvanocaustic treatment, introduced by Carl Michel, in 1873. Following his example, I was soon convinced that the cautery cures the troublesome symptoms of this affection more surely, and with less inconvenience to patient or operator, than any of the other methods in use. The galvano-cautery, however, is an expensive instrument, and it is apt to get out of order. This led me to seek for a simpler means of cauterizing the pharynx than is afforded by the battery; and I naturally turned to the plain actual cautery. A few trials made it apparent that patients did not seriously object to its use, even when it was heated before them in the fire. To obviate, however, any occasional alarm from this cause I resorted to the use of a small gas-heater, which is now before you. The heater† costs from 4*s.* 6*d.* to 8*s.* 6*d.* The cautery is a piece of thick wire, fourteen inches long, with a pear-shaped bulb at one end, and any blacksmith can make it for a shilling or two. Placed in the noiseless heater, which is concealed by a small box or screen from the patient's view, the cautery may be got ready in less than one minute. The cautery bulb is used at a dull red heat. The patient's tongue being depressed by a spatula, the cautery is passed straight into his mouth in a line from the right ear of the operator, steadily held for two seconds against the spot of the pharynx selected for its application, and then withdrawn in the same line in which it entered. If the cautery is hurriedly used, or if it is entered or withdrawn obliquely, it is apt to touch other parts of the mouth or the lips, and then it gives pain; but if deliberately used only to the thickened nodules on the pharynx or tonsils, the pain caused by it is trifling and transitory. During the following day there is always a period of swelling and uneasiness, but this rarely lasts beyond twenty-four hours; and it may be greatly relieved by the use of marshmallow lozenges, or by the simple expedient of swallowing a small piece of fresh butter. The eschar separates in a few days without further pain, and the cautery may be used, therefore, once a week. No other treatment is necessary during its use in most cases; but, of course, it need not interfere with other treatment, nor need the patient depart in any way from his usual course of life. I am satisfied with the efficiency of this mode of treating cases

* *Brit. Med. Journal*, Sept. 22, 1877; and *Glasgow Med. Journal*, Oct. 1877.
† Made by Fletcher, of Warrington.

of nodular and granular thickening of the pharynx and tonsils. Enlarged tonsils, which are not suitable for removal by the knife or guillotine, may be reduced completely by successive applications of the actual cautery. Patients have assured me that they would willingly bear the slight pain of the burning ten times over in order to get rid of the annoying symptoms of the disease; and experience shows that after the unhealthy tissue of enlarged tonsils has been removed by the cautery, the tendency to recurring acute attacks of tonsillitis is almost, if indeed not quite, abolished. In using the cautery, the points to be remembered are:—(1) To select carefully beforehand the individual places to be touched. (2) Not to apply it indiscriminately, or to more than two, or at most three, places at one sitting. (3) To avoid haste, and not to touch the lips or tongue. As compared with the galvano-cautery, it is cheaper; it is more handy; it is more rapidly got ready; and it can practically never get out of order. It presents advantages also over the London paste, recommended by Morell Mackenzie. From comparative trials it has been found less painful than the paste; it is entirely free from the distressing hawking of abundantly secreted mucus, which follows on the use of the paste; and, in fact, I have never seen any patient require to expectorate or to gargle after the cautery was applied. The eschar, after the cautery, is dry, distinct, and limited to the spot selected. Gratifying results are sure to follow its use in the proper cases, and I have brought this instrument before you in the wish to gain for it a wider trial in your hands.

On the Use of the Galvanocaustic Method in Nose and Pharynx.

Dr. V. Lange, Copenhagen.

Galvanocaustic method is to be regarded free from danger in diseases of the nose and pharynx.

(*a.*) Diseases of Nose.

1. As a rule unnecessary in operation for pedunculated nasal polypi, the cold wire being sufficient in almost all cases; on the other hand, useful and preferable to all other caustic methods in after-treatment—*i.e.*, the destruction of the remnants of polypi.

2. Best plan for treatment of hypertrophies of the mucous membrane and polypoidal excrescences.

3. Often indispensable in lupus of the nose, especially where sharp spoon or scarification is impracticable on account of a certain infiltration of the soft parts.

4. May be useful in punctiform hæmorrhages of the nose, but is quite inadequate in profuse hæmorrhages.

(*b.*) Diseases of the Pharynx.

1. As a rule unnecessary in hypertrophy of the tonsils.

2 and 3. Best plan in granulations and swollen mucous folds.

4. Not to be regarded as the chief remedy in adenoid vegetations.

DISCUSSION.

Dr. Löwenberg, Paris: I attribute the general excellent action of galvano-cautery to the antiseptic action of the high temperature, 130·0° C., a germ-killing means not to be equalled by any other one. The nose is a receptacle for bacteria, drawn in by inspiration. The galvano-cautery destroys them, and the eschar (scab) covers and protects the burned place from infection. As to hæmorrhage, I believe the action of red-hot platinum prevents bleeding; white-

hot causes it by destroying the walls of the vessels as well as the clots, thus preventing stasis of blood. I use as a battery Planté's *éléments secondaires.* Nose: I have invented a nasal galvano-cautery, only burning laterally, thus avoiding cauterization of the septum, and allowing of the localization of the galvano-cautery to the sides of the nose. I have just published a paper on the treatment of chronic coryza,* where I extol the galvano-cautery as the treatment for the nose the same as in mucous polypi. It is excellent, too, for tonsils, where these new instruments protect palate and pharynx. The best treatment for mucous polypi is the cold snare and the subsequent use of the galvano-cautery. I prefer snaring to Voltolini's beginning by burning *dans le tas.* I protest against the idea that the galvano-cautery can provoke dangerous inflammations. I have never seen any, and I believe this is due to the antiseptic action I described above.—Pharynx: Excellent, under certain precautions, to be given to-morrow in my paper on "Adenoid Vegetations." I think, in opposition to Dr. Solis Cohen, that galvano-cautery is indispensable for lateral adenoid growths. I do not approve of Dr. Foulis's system of using actual cautery in the throat. The advantage of galvano-cautery is that it can be applied cold, so as to act only when in contact with the part desired to be destroyed.

Dr. THUDICHUM, London, described his method of dealing with all the different forms of tumours, hypertrophic changes, polypoid degenerations, exostoses, &c., found—sometimes associated with one another—in the nose. He also gave a description of the instruments he had invented for this purpose.

Dr. BOSWORTH, New York: The highly-tempered steel-wire snare affords a means of removing pharyngeal fibromata. For the treatment of enlarged follicles in the pharynx, a strong wire, heated in a spirit lamp, is better than either galvano-cautery or the formidable cautery irons of Dr. Foulis. With reference to Dr. Thudichum's remark, that the hypertrophy of the lower turbinated bones, anteriorly and posteriorly, had not been described, I wish to call attention to a full description of this feature of nasal catarrh in my recent book on "The Throat and Nose." As regards Dr. Thudichum's transfixion needle, I have long used it in connection with the snare.

Dr. RUFUS LINCOLN, New York: I fully indorse Dr. Solis Cohen's views; but regret that he has not described the method more in detail. I recommend that after the removal of pedunculated nasal polypi, either by the galvano-caustic method or by the cold wire, the stump should, at any rate, be repeatedly touched by the galvano-cautery until it is completely destroyed; this will effectually prevent recurrence. As a proof of this statement, I should like to refer to two most desperate cases of this sort which I showed two years ago to the American Laryngological Association. They had been operated upon before repeatedly, inasmuch as recurrence had taken place several times; but, by observing the plan recommended above, I finally succeeded in effecting lasting cures.

Dr. W. MEYER, Copenhagen: The thermo-cautery, which has not been mentioned, is certainly very useful for removing granulations from the posterior wall of the pharynx.

Professor VOLTOLINI briefly replied.

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* *Union Médicale.*

*Adenoid Vegetations in the Vault of the Pharynx.**

Dr. W. Meyer, Copenhagen.

The considerable and increasing interest which adenoid vegetations in the vault of the pharynx have elicited during the comparatively short time since their discovery, appears by no means to be due only to their connection with affections of the ear. Three circumstances seem in this respect to have been of greater importance: First, the frequency of their occurrence: whenever, both in Europe and elsewhere, they have been sought for, they have been found. Next, the fact that well-marked cases, once known, are so very easily recognisable: you meet them in saloons, in public conveyances, nay, even in the remembrances of your childhood. Last, not least, deserves to be mentioned the facility with which, again, in well-marked cases, vegetations may be removed, and the striking immediate effect, which in such cases even a partial removal may exert upon the symptoms, These circumstances, no doubt, account for the great interest taken by specialists in these operations, for the innumerable methods and instruments devised, as well as for the literature to which these operations have given rise,

Before proceeding to the pathological part of this introduction, which because of the shortness of time compared with the vastness of the scheme, will claim your forbearance for being treated in an aphoristical way, I beg permission for a remark about the name of the growths in question. I should say that the affection, being a thoroughly international one, deserves likewise a name which is the same in all languages. About the adjective there can hardly be any doubt, the microscopical structure being eminently characteristic; as to the substantive the name of "vegetations" may be found preferable to the others proposed in this respect: that it admits of no proper translation into any of the modern languages. I, therefore, propose to this Section to fix upon the name of "adenoid vegetations" for the growths we are to treat upon.

As to their anatomy, so well known by you, a few remarks will suffice. Of their two prevalent forms, the cristate and the cylindrical, the first frequently, the second are never to be considered as representing a hyperplastic state of physiological prominences. The place of election of the cristate vegetations is the posterior wall of the pharynx, especially its upper curved part, the cylindrical ones mostly occupying the lateral walls. Another practical distinction of even more importance is their difference of consistence. They may be soft, brittle, or hard and tough—in the latter cases they are mostly covered with a thick mucous lining. In spite of these differences they are all composed of the same adenoid tissue, which lines the greater part of the vault of the pharynx, and from which they only differ in their greater vascularity and, as far as my experience goes, in their showing a certain erectility. The mucous secretion from the adenoid vegetation is commonly abundant, and the tissue around them is always in a state of chronic catarrh. Also the neighbouring organs lined with mucous membranes are mostly found in an abnormal state; thus the middle ear, the turbinated bones, the soft palate, the tonsils, and the oral part of the pharynx. The latter is often affected with granular inflammation. Now, if these vegetations entirely fill up the vault of the pharynx—which rarely occurs, or if they are less in number, but partly situated in a manner to fill up the split between the edge of the soft palate and the opposite posterior wall of the pharynx, it is obvious that in both cases the passage of air through this cavity must be intercepted from both sides. This obstruction will give rise to a series of characteristic symptoms, amongst which

* With a plate showing the instruments described in the paper.

the expression of the face, and what I propose to call the "dead" pronunciation are the most prominent. The characteristic face shows itself by the mouth being constantly kept open, and the nose, by its long inactivity becoming collapsed, pinched, further by a vacant expression of the features and a dim look of the eyes, the orbicular muscle of the mouth no longer giving support to the other facial muscles. The "dead" speech is composed of two constituents: firstly, the impossibility of pronouncing the nasal sounds *m*, *n* and *ng*; secondly, by the loss of resonance in the anterior and posterior nares. Another series of symptoms is owing to the vascularity of, and copious secretion from, the vegetations as well as to the catarrh of the environing mucous membrane. To this series belongs the occurrence of blood in the mouth after awaking from sleep, an habitual headache, and the complicating affection of the ear. The latter forms a frequent concomitant of the growths in question, and may be transient or lasting, varying in degree from a slight want of acuteness in hearing after taking cold, to a chronic dry catarrh in the tympanum, chronic discharge from the ears and insupportable noises. It will easily be understood that vegetations grouped around the apertures of the Eustachian tubes are particularly apt to produce complications in the shape of affections of the ear.

In well-marked and uncomplicated cases, the symptoms by themselves will commonly suffice for establishing a correct diagnosis. But complications being frequent, and the characteristic symptoms sometimes wanting in cases (for instance, affections of the ear) where it may be desirable to know whether vegetations are present, physical means of diagnosis must be had recourse to. Three ways of investigation are here available—viz., posterior and anterior rhinoscopy and digital examination. If possible, all of them ought to be employed combined; for it must be remembered that in this affection, as in all others, a thorough diagnosis of the case is indispensable for securing a successful treatment. If only one method can be employed, digital examination is preferable. The practised finger used gently will, without giving real pain, reveal with sufficient clearness the number, situation, size, shape, consistence, and vascularity of the growths. Moreover, digital examination is applicable under all circumstances. Yet, it is but fair to state that the application of either of the two other methods, particularly of posterior rhinoscopy in certain cases, is indispensable, and that results of a high diagnostical and therapeutical value may be obtained by them, which digital examination is unable to yield.

It may not be superfluous to add that if, in spite of physical diagnosis, any doubt should occur as to the nature and character of the growths found, the microscope is the only infallible means to solve it.

Regarding the etiology, we know that youth is the most important of the predisposing causes. Of 295 patients of which I have taken accurate notes, only twenty-three were above twenty-five years, whereas 165 were below fifteen. According to my experience, the affection is more frequent with boys than with girls. Some children appear to be born with vegetations. Another predisposing cause is family disposition. I have eleven times found two, seven times three, once four children of the same family affected; and in not a few cases one or both parents were, or had been, suffering in a similar way. As to scrofula its influence is doubtful: recent observations of Dr. Wiesener, of Bergen (Norway), seem to show that (by emigration of lymphatic cells) adenoid vegetations do not unfrequently give rise to so-called scrofulous infiltration of lymphatic glands. Adenoid vegetations are met with in all classes of society, from the lowest to the highest, as well as in all climates, in which they have been sought for. Amongst the first patients who presented themselves to a medical friend of mine, after his arrival at Bangkok, in the

Tropics, were two sisters, with numerous adenoid vegetations, and whose mother had suffered from the same complaint. From Chicago and New York I possess information about their rather frequent occurrence; and in different parts of Europe medical authorities agree more and more as to their frequency. A damp and cool climate, however, appears especially to favour their development. This we may conclude from some statistics which we possess about the frequency of vegetations amongst school-children. Amongst about 700 children in public schools in Florence, my brother, Dr. Adolph Meyer, found not quite 1 per cent. with the characteristic faces and "dead" pronunciation; I arrived at nearly the same result by examining a similar number of school-children at Stockholm. At Copenhagen I found 1 per cent. of 2,000 children suffering in this way. In England (Haverstock Hill Orphan School) I met with 2 per cent ; while my friend, Professor Doyer, among 4,000 school-children at Leyden, found 5 per cent. with characteristic faces and pronunciation.

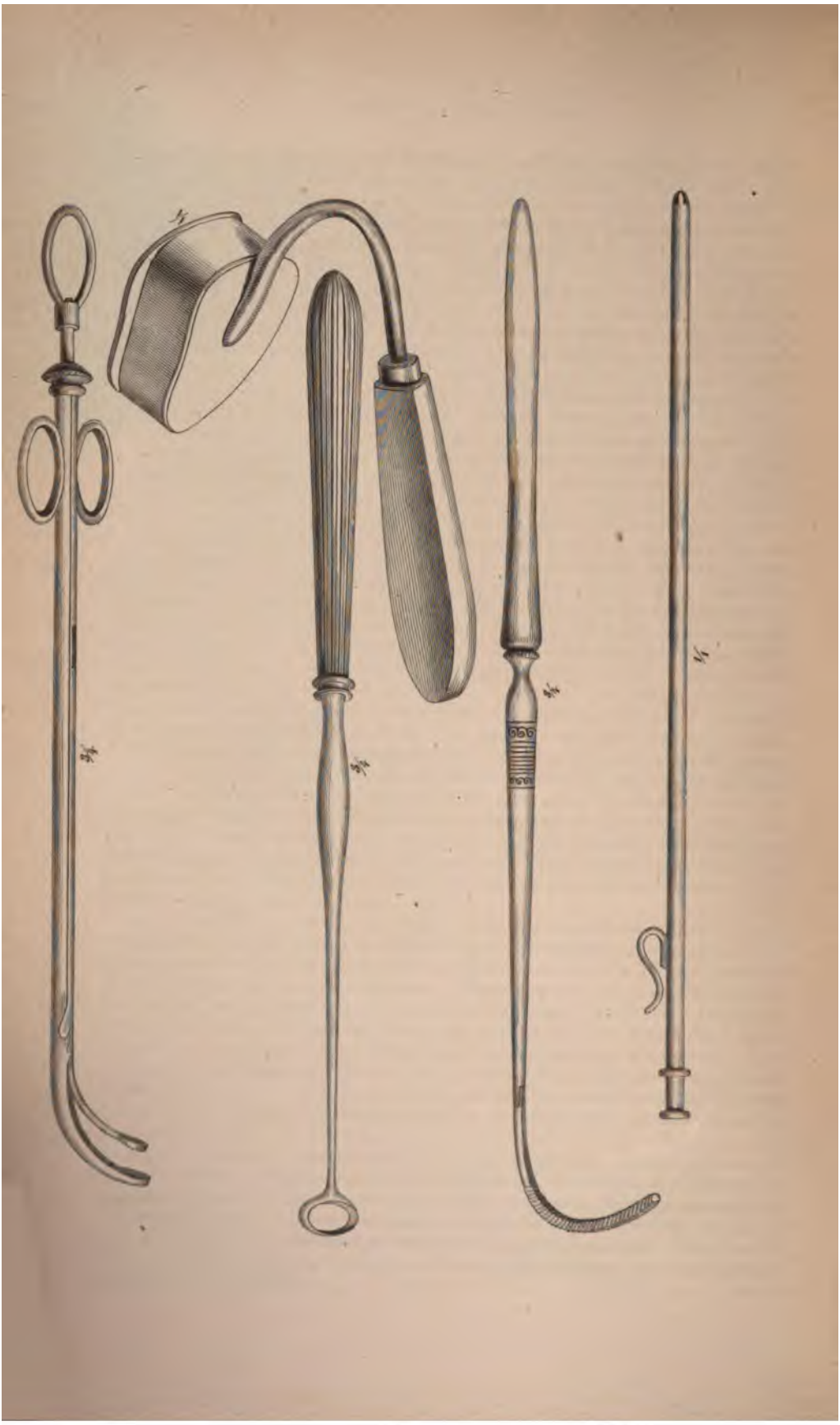
Considering, then, the universal frequency and the damage done by the vegetations, not only to the appearance but to one of our highest senses, it appears most desirable that not only specialists, but medical men in general, should pay particular attention both to their diagnosis and treatment.

Of occasional causes, we know colds, measles, and local irritation. Measles appear to produce, colds to develop them; and, as to the influence of local irritation, it may be adduced what already has been stated in the *Lancet*, of 1869, by the English dentists, Coles and Smith, that people with cleft palate are particularly liable to hyperplasia of the adenoid tissue in the vault of the pharynx; which statement I fully confirm, in accordance with my experience, with the addition that the larger the cleft, the more numerous and the larger will the vegetations be.

Regarding the prognosis, we shall have to consider both the prognosis of the vegetations themselves and that of the concomitant affection. It is an acknowledged fact that vegetations left to themselves will shrink and disappear in mature age. Consequently they might be left alone if they did no mischief before their disappearance. This, however, they are very apt to do. It has been observed that by way of inflammation they may occasion retro-pharyngeal abscesses (Wiesener); they may further give rise to glandular swellings and inflammations; but by far the greatest and most frequent damage is that done to the ear and to the hearing. Therefore, when vegetations are known to be present, they should be removed.

And I can conscientiously assert that this may be done with perfect safety in any case. Unless organic complications be present, the symptoms will disappear with the growths that had given rise to them, and will never return if the treatment has been a thorough one. I have recently had the opportunity of examining several cases upon which I had operated many years ago, and I have found the vault absolutely free from growths, and no symptoms. Nay, even the most important of complications, the affections of the ear, will, in a surprisingly great number, be benefited by the removal, disappear, or become more tractable. Of 198 patients whom I treated for defective hearing in combination with adenoid vegetations, upwards of 42 per cent. regained their full power of hearing.

Some remarks may here be added about the prognosis of measles and scarlet fever, as influenced by the presence of vegetations. Experience has shown that a comparatively great number of patients whose ears are affected in consequence of these eruptive fevers, present adenoid vegetations in the vault of the pharynx; and it is obvious that vascular growths, with abundant secretions in proximity of the middle ear cannot but influence these organs if the surrounding mucous membranes are inflamed.



From a satisfactory treatment of adenoid vegetations, we will have to exact :—

1.—That it should remove all the growths.

2.—That it should prevent their recurrence.

3.—That it should do away with the concomitant catarrh in the vault of the pharynx.

Several methods may serve this end.

If the vegetations are soft, few, and small, I have several times seen them disappear after long-continued injections of medicated fluids through the nose. For these injections I recommend, as Weber's douche is not without danger, a slender metal tube, whose closed extremity is perforated by two splits, forming a +, and which is attached to a valve syringe.

If they are soft, but more copious, cauterization with solid nitrate of silver, mixed with two parts of saltpetre, will be found useful. A metal stem, the slender and curved end of which is covered with platinum, appears to be a convenient instrument for this purpose. Cauterization should be continued about once a week, until all vegetations have disappeared. As long as any, even slight, bleeding is caused by the application of the caustic, cauterization should not be discontinued. Injections of salt water wash away the superfluous caustic, and similar injections should be continued long after the cauterization, the catarrh of the vault of the pharynx being always obstinate.

A third method of destroying soft vegetations is that of bruising them with the pulp of the exploring finger, and scraping them off with the nail. To ensure a lasting result, this crushing should be followed by the above cauterizations and injections.

Whenever the vegetations are hard or covered with a tough lining, an operative procedure with cutting instruments is indicated, unless galvano-cauterization be employed. Many methods of operations have been devised within the last seven years, and the published results prove that adenoid vegetations may be successfully treated in several ways—at least, as to the immediate result. In order to judge the final result, I will state that a year must have elapsed after the termination of the treatment. Not having had occasion myself to use any other methods than my own, except galvano-cauterization, I am not qualified to judge them. The only remark concerning them which I shall venture is this, that any method, in the performance of which the cutting instrument is guided neither by the finger nor the eye, will have to be abandoned as dangerous.

I will now shortly describe the method which I have used for upwards of thirteen years, and which has proved so satisfactory to me that I have felt no desire to change it. Besides the two instruments named, I use two others : a ring knife, consisting of a small transverse oval ring, with one sharp though not absolutely cutting edge, and fixed on a slender but firm steel stem, whose other extremity is attached to a wooden handle ; next a gag, which consists of a triangular piece of ebony, armed on either side with a larger metal plate, and attached to a curved stem, which bears a wooden handle.

The patient being seated, an assistant, standing behind him, holding his slightly bent head, the operator, who stands in front of the patient, begins with introducing the gag between the patient's left molar teeth. Whilst the assistant takes hold of its handle, the surgeon passes his left forefinger over the patient's tongue into the vault of the pharynx, and immediately after he passes the ring knife—the axis of the ring being kept perpendicular—through the widest side of the nose. The finger and the ring having met behind the posterior nares, the ring is moved in a downward direction, so as to scrape off the vegetations at their base, the point of the finger serving as a *point d'appui* for the instru-

ment. In this way the operator works gradually on from above downwards, the finger all the time controlling the movements of the ring, until everything necessary has been removed. In case the operation cannot be finished through one nostril, the instrument has to be removed, the finger remaining in its place, and introduced through the other nostril in order to complete the removal.

The bleeding is commonly considerable, but it soon stops. To facilitate this, as well as to wash out blood-clots and remains of vegetation, a strong stream of cool salt water with some carbolic acid is next injected over the bleeding surface by means of the metal tube. This injection is followed by a cauterization with solid mitigated nitrate of silver. Finally, the superfluous caustic is neutralized by a second injection.

The operation is never a very painful one. I remember even having performed it on a timid boy, 11 years old, without his being aware of it. He had for some time previously been prepared by daily introducing both the finger and the ring knife into the vault of the pharynx.

Commonly the operation is followed by some headache, sometimes by a slight stupor: both usually disappearing on the same day after a short sleep.

In former years I have (in five cases) seen an acute inflammation of the tympanum follow the operation. The like has not occurred for the last four years, and this is due, so far as I can see, to the fact I have not meddled with the wounded surface at all in the first week after the operation. After the lapse of a week, the after-treatment has to begin. Formerly I was not unfrequently obliged to repeat the operation. Improved technicality, however, and the introduction of a more methodical after-treatment, have of late years made the repetition almost absolutely unnecessary. In some very rare cases in which tough vegetations were situated on the side-walls a second operation has occasionally been indicated—for which I use a special instrument (called duck's bill), curved like an ear-catheter and shaped like a small lithotrite, but with spoon-shaped cutting ends.

The after-treatment I have found to be of the very greatest importance, experience having taught me that if any remains of the adenoid vegetation are left, they will inevitably grow again. In thirteen of my cases I have found the growths to have recurred; in some of them the treatment had been interrupted before the after-treatment was completely finished, in others the after-treatment had been confided to unpractised hands. What accidentally will remain, in spite of a thorough after-treatment, are small wart-shaped prominences on the walls of the vault, easily known by their not bleeding when pressed by the finger: they are the remains of the tough mucous linings of the destroyed vegetations.

In several cases I have with benefit begun the after-treatment with galvano-cauterization. As a rule, however, the above-described cauterizations with mitigated nitrate of silver are employed, along with daily injections. I would impress upon you not to become tired of cauterizing as long as any soft and bleeding remains of the vegetations can be discovered. The douche is to be continued long afterwards; bicarbonate of soda or chlorate of potash, or both in combination, dissolved in the injected water, will, in obstinate cases, serve the purpose.

Another kind of after-treatment is what I would term the gymnastic one. It consists in accustoming the parts which have been out of use (the nose, the soft palate) to their proper functions.

I conclude with wishing that the treatment of adenoid vegetation in the vault of the pharynx may afford to many of you the same satisfaction and pleasure which I have derived from it.

Les végétations adénoïdes dans la voûte du pharynx.

Dr Loewenberg, Paris.

I.

Le sujet que je vais avoir l'honneur de traiter devant vous possède une portée qui dépasse de beaucoup le domaine d'une spécialité de l'art de guérir. L'affection qui nous occupe, siégeant au pharynx supérieur, carrefour important des voies nasales et auriculaires, entraîne des conséquences pour la santé et l'avenir social des malades, et s'impose, par là, à l'attention de tous les médecins.

Malheureusement nous constatons tous les jours des faits qui prouvent combien les notions importantes concernant cette affection sont loin d'être suffisamment connues. Je crois donc devoir saisir l'occasion de faire profiter ce sujet du retentissement exceptionnel d'un congrès international. Grâce à lui, en effet, ces notions éminemment utiles dépasseront le cercle restreint des spécialités et se répandront davantage dans le monde médical.

L'ensemble des phénomènes provoqués par les tumeurs adénoïdes du pharynx nasal a dû se révéler, de tout temps, non seulement aux médecins, mais encore aux personnes étrangères à notre science. En effet, ces symptômes : bouche entr'ouverte, nasonnement, surdité plus ou moins prononcée, se réunissent pour former un type physionomique très-caractéristique. Mais ce n'est qu'à une époque récente, lorsque le miroir rhinoscopique a été découvert, que leur véritable signification a pu être reconnue : on a compris alors que cet ensemble de phénomènes morbides reconnaissait pour cause un obstacle dans la région supérieure de la cavité pharyngienne. Bientôt après, mon savant collègue, M. Meyer de Copenhague, est venu nous montrer, dans un excellent travail, que les végétations formant cet obstacle, sont simplement le produit de l'hyperplasie du tissu adenoïde, qui entre pour une si large part dans la composition des parois du pharynx.

Une fois le siége et la nature de l'affection reconnus, l'enchaînement de ses conséquences devenait évident. Le rétrécissement que les végétations constituent aux arrière-narines, interdit à la respiration le parcours du nez et l'oblige à emprunter la route buccale, de sorte que la bouche reste constamment entre-bâillée. Le malade ne peut plus former les consonnes et les voyelles nasales dont l'émission exige que le nez soit libre. Obligé de les remplacer par d'autres, il nasonne en parlant. En obstruant l'ouverture gutturale de la trompe d'Eustache, ou bien en lui communiquant un état inflammatoire, les tumeurs adénoïdes provoquent souvent en outre une otite catarrhale ou suppurative, et constituent ainsi une source fréquente de surdité chez les enfants.

Une affection qui entraîne les conséquences pathologiques que je viens d'énumérer mérite certes de fixer l'attention. Son étude est d'autant plus fructueuse que, la cause du mal reconnue à temps, il est possible, par des moyens chirurgicaux exempts de tout danger, d'enlever l'obstacle mécanique et tout l'enchaînement de ses effets pathologiques. Si, au contraire, l'ablation n'est pas faite en temps utile, tous les accidents consécutifs deviennent incurables, et c'est à cette négligence que sont dues beaucoup des surdités graves qui, datant de l'enfance, se prolongent pendant la vie adulte. Il en est de même pour la respiration buccale et l'expression particulière de la physionomie due à l'entre-bâillement de la bouche, conséquences de l'affection en question qui s'enracinent, à moins qu'on ne pratique à temps l'ablation des végétations.

Le moment me semble donc propice pour insister sur la responsabilité qu'on encourt en privant les malades des bienfaits de ce progrès important de

notre science. Je vais, Messieurs, vous soumettre mes observations sur ce sujet et les résumer dans une série de conclusions pour lesquelles je serais heureux d'obtenir l'appui de votre haute autorité scientifique.

Voici la première de ces conclusions :

Conclusion No. 1.—La suppression de la respiration nasale et le nasonnement, accompagnés généralement de troubles auriculaires, forment un ensemble symptomatique fréquent dans l'enfance et l'adolescence. Il est dû, non pas à une affection nasale ni amygdalienne, mais à l'existence, dans le pharynx nasal, de tumeurs composées, dans l'immense majorité des cas, de tissu adénoïde.

La dernière partie de cette conclusion se rapporte au diagnostic différentiel de ces végétations. Il se peut, en effet, que des tumeurs bien autrement redoutables, des polypes pharyngo-nasaux, ne présentent, à leur début, que de simples phénomènes d'oblitération nasale, et qu'il soit possible, pendant un certain temps, de les confondre avec des végétations adénoïdes. Mais, outre que la première de ces affections est infiniment plus rare que la prolifération adénoïde, elle s'accompagne de très-bonne heure de désordres sérieux caractéristiques, tandis que les tumeurs qui nous occupent ne sont nullement destructives ni envahissantes, et qu'on parvient facilement à les détruire d'une façon définitive.

Mais il y a des confusions que nous voyons commettre plus fréquemment, et je voudrais ajouter quelques mots pour faciliter le diagnostic différentiel à nos confrères moins versés dans ce chapitre spécial.

Je ne m'occuperai pas de l'erreur qui consiste à attribuer tout cet ensemble symptomatique au lymphatisme ou à la scrofule, sans se dire qu'une cause mécanique seule peut provoquer des phénomènes d'obstruction aussi manifestes.

Il est plus compréhensible, par contre, que ceux qui ne sont pas au courant des procédés spéciaux d'exploration, exigeant, comme la rhinoscopie par exemple, une grande habitude, se trompent sur le siége de l'obstacle et le placent soit dans les fosses nasales, soit dans les amygdales.

Quant à celles-ci, un savant du pays qui nous offre en ce moment une si gracieuse hospitalité, Harvey, a combattu victorieusement l'opinion générale qui attribuait des troubles auriculaires à l'action directe des amygdales engorgées. Convaincu qu'il faut en faire autant quant à leur prétendue influence sur les cavités du nez, j'ai déjà fait ressortir autrefois qu'il me semblait inadmissible que l'hypertrophie tonsillaire puisse rétrécir, non pas seulement la voie bucco-pharyngienne, ce qui est incontestable, mais également, en refoulant le voile du palais en haut, la route nasale, au point de la fermer.

En dehors de toute considération théorique, l'examen attentif de beaucoup de personnes atteintes d'engorgement des amygdales m'a confirmé dans cette manière de voir, et m'a appris, en outre, que lorsque cette affection s'accompagne de symptômes d'obstruction nasale, ceux-ci sont dûs à des végétations adénoïdes existant simultanément. J'ai observé un certain nombre de cas qui présentaient en même temps ces deux affections, cas nullement surprenants, car le tissu adénoïde (ou lymphoïde) dont l'hyperplasie est si caractéristique pour la diathèse lymphatique, abonde aux amygdales comme à la muqueuse du pharynx nasal et peut proliférer dans les deux endroits en même temps. J'ajoute que les symptômes de gêne respiratoire n'en sont qu'augmentés, l'engorgement tonsillaire rétrécissant la voie buccale, les végétations pharyngiennes obstruant les arrière-narines. Dans ces cas, l'ablation des amygdales était impuissante à faire disparaître les phénomènes d'obstruction, qui cédaient, par contre à l'extirpation des tumeurs adénoides.

La confusion avec la simple hypertrophie des amygdales écartée, on ne peut hésiter qu'entre les tumeurs adénoïdes et le coryza chronique. Outre que celui-ci appartient plutôt à l'âge adulte qu'à l'enfance, la question est tranchée aisément

par un procédé facile à apprendre : la palpation. Il suffit de s'être exercé par l'examen d'un petit nombre d'enfants pour pouvoir reconnaître immédiatement l'existence d'une hyperplasie adénoïde assez avancée pour encombrer les arrière-narines. Dans l'immense majorité des cas dont nous nous occupons, on la constatera et on trouvera les fosses nasales indemnes; je n'ai vu le contraire que dans des cas excessivement rares. D'ailleurs les troubles auriculaires manquaient chez les quelques enfants où j'ai vu le coryza chronique simple (non spécifique); lorsqu'un enfant présente des phénomènes d'obstruction nasale et de la surdité, il y a donc une présomption, pour ainsi dire, absolue en faveur des tumeurs adénoïdes.

II.

L'influence des végétations adénoïdes ne se borne pas toujours au pharynx, aux fosses nasales et aux oreilles, mais peut s'étendre au-delà de ces cavités. J'ai décrit, en 1878, une déformation particulière du thorax qui s'est rencontrée chez les deux tiers environ des malades atteints d'hyperplasie adénoïde du pharynx.

Bien que cette déviation de la configuration normale montre des degrés divers chez différents individus, elle présente toujours un même type caractéristique, dont les traits saillants peuvent se résumer ainsi : Les côtes sternales sont déprimées vers le poumon ; leurs cartilages, au contraire, bombés en dehors, forment une série de saillies, sans cependant offrir le chapelet noueux du rachitisme. Le sternum, au lieu d'être projeté en avant, comme dans cette dernière maladie, est notablement déprimé, surtout vers l'apophyse xiphoïde qui est souvent profondément repoussée en dedans.

Cette déformation atteint quelquefois un degré considérable, ainsi on m'a présenté un jeune malade comme portant une tumeur à l'épigastre; or la tumeur n'était autre chose que la déformation que je viens de décrire, parvenue, il est vrai, à un développement extraordinaire.

Depuis ma publication, quelques observateurs ont émis des doutes quant à l'exactitude du fait signalé par moi. En présence de ces négations, j'ai continué mes recherches sur un grand nombre de sujets, et je ne puis que maintenir mon affirmation. Je dois dire, à ce propos, que la symptomatologie de l'affection, en dehors des grands traits caractéristiques, est présentée d'une façon un peu divergente par différents observateurs. Ainsi on cite, parmi les signes caractéristiques, des maux de tête fréquents et opiniâtres, qu'il m'a été impossible de constater chez mes malades, malgré une investigation d'autant plus scrupuleuse que l'affirmation émanait d'auteurs compétents.

Quant à l'étiologie de la déformation thoracique, nous pouvons écarter le rachitisme, car, outre que la forme du thorax est tout autre dans cette maladie, comme je viens de le prouver, je me suis assuré par l'examen de beaucoup de sujets vivants et par l'autopsie d'un certain nombre de rachitiques qu'il n'y a aucun rapport entre cette affection et l'hyperplasie adénoïde du pharynx.

Il ne nous reste donc qu'à chercher l'origine de la déformation de la poitrine dans la gêne respiratoire due à l'encombrement de la voie naso-pharyngienne. Mais comme la respiration buccale à laquelle les malades finissent par avoir recours, ouvre à l'entrée de l'air un chemin suffisant, il faut invoquer les conditions particulières dans lesquelles s'opère le changement du mode respiratoire. C'est dans ce sens que j'ai proposé d'expliquer la genèse de la malformation thoracique par ce qui se passe pendant la période de transition entre les deux manières de respirer. Ce changement a lieu, sans doute, à une époque très-reculée de la vie, alors que les tumeurs, en grandissant, commencent à rétrécir les arrière-narines, sans que l'enfant ait encore appris à bien pratiquer la respiration par la bouche.

On sait que, pendant l'inspiration, à mesure que les muscles tendent à dilater le thorax, la tension du contenu gazeux intra-pulmonaire diminue, et que l'équilibre se rétablit par l'entrée de l'air à travers les fosses nasales. Lorsque celles-ci s'obstruent, l'air ne peut plus entrer en quantité suffisante, et alors la pression de l'atmosphère sur les parois du thorax prédomine pendant l'inspiration et la poitrine s'affaisse sur elle-même. L'élasticité du tissu pulmonaire favorise cet affaissement. Comme ces troubles se manifestent chez des enfants en pleine croissance, ils peuvent, à la longue, entraîner des effets durables et imprimer à la cage thoracique l'affaissement définitif en question.

Mais il reste à expliquer la voussure des cartilages costaux. Peut-être résulte-t-elle de ce que l'enfoncement de leur deux points d'insertion, la côte et le sternum, a pour effet de bomber, par une pression latérale, ces cartilages en sens opposé, c'est-à-dire, vers l'extérieur.

Depuis Dupuytren, on attribue à l'hypertrophie des amygdales l'origine d'une déformation du thorax qui présente, d'après la description des auteurs, quelque analogie avec celle dont je viens de traiter. Or, ce grand chirurgien dit lui-même* que, dans ses cas, la résection des amygdales ne faisait pas cesser la difficulté de respirer, ce qui s'accorde parfaitement avec ma manière de voir, qui attribue cette difficulté à la coëxistence de tumeurs adénoïdes. Il est vrai que la déformation que j'ai décrite diffère par quelques détails de celle causée, d'après les auteurs, par l'hypertrophie des amygdales, mais je ne puis faire autrement que d'attribuer cela à des examens incomplets, témoin la confusion manifeste que Dupuytren lui-même fait entre cette déformation spéciale et le thorax rachitique.

Conclusion No. 2.—Chez un certain nombre d'enfants atteints de cette affection, la gêne respiratoire entraîne une déformation particulière de la cage thoracique.

III.

Les végétations dont nous venons d'étudier l'influence, sont le produit de l'hyperplasie du tissu adénoïde si abondamment représenté dans la muqueuse du pharynx nasal. Aussi atteignent-elles le plus grand développement là où se trouve la plus forte agglomération de ce tissu, à savoir la région supérieure et postérieure de l'organe, occupée par la tonsilla pharyngea de Luschka. Dans tous les cas de végétations adénoïdes que j'ai examinés, celle-ci s'est trouvée hypertrophiée, souvent seule, d'autres fois simultanément avec des parties plus ou moins étendues des parois latérales.

La forme la plus commune est celle où l'hypertrophie porte exclusivement ou principalement sur l'amygdale pharyngienne. Dans le premier cas, l'affection se trouve confinée au siége de celle-ci, à la région supérieure et postérieure du pharynx nasal. L'image frappante d'une crête de coq donnée au rhinoscope par cette forme nous a révélé l'existence de l'affection. C'est cette découverte qui a attiré l'attention sur la région pharyngo-nasale, terrain si peu exploré avant Czermak, qu'on aurait pu l'appeler, en variant un peut le mot d'Albert de Haller : *difficillima particula pathologiæ.*

Les dentelures de cette crête correspondent aux lobes antéro-postérieurs de la tonsille pharyngienne, vus en raccourci au miroir rhinoscopique.

Cette forme présente, chez différents malades, les degrés de développement les plus divers, d'une légère hypertrophie, ne gênant en rien le fonctionnement du pharynx ni de ses annexes, à une prolifération qui remplit absolument les arrière-narines. Prononcée à ce dernier point, elle trouble profondément le

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* Dupuytren, Mémoire sur la dépression latérale des parois de la poitrine, in *Répertoire Gén. d'Anat. et de Physiol. Pathol,* p. 112. 1828.

passage de l'air par le nez, la prononciation et le jeu physiologique des trompes d'Eustache.

J'ai remarqué que les cas où les désordres auriculaires faisaient défaut, étaient justement ceux d'une hypertrophie modérée de l'amygdale de Luschka seule, hypertrophie suffisant pour rendre par son épaisseur l'ouverture nasale postérieure trop étroite, mais n'atteignant pas en largeur la partie gutturale de la trompe d'Eustache. Par contre, l'oreille souffre, lorsque la tonsilla pharyngea grossie arrive en contact avec celle-ci, ou qu'il existe des tumeurs latérales qui l'affectent directement.

Parmi les cas où les parois latérales des arrière-narines étaient également malades, j'ai quelquefois observé une forme particulière ; c'était une hyperplasie diffuse et uniforme du tissu adénoïde du pavillon de la trompe d'Eustache, qui ressemblait vaguement. par son épaissement général, à un petit col utérin.

Quelquefois les tumeurs se montrent dans tout le pharynx nasal à la fois ; c'est là que le miroir rhinoscopique nous révèle des images confuses, très-difficiles à interpréter. C'est un chaos de bosses, de crêtes et de pointes, où il est impossible de reconnaître les points de repère habituels, le bord postérieur de la cloison nasale et les saillies des pavillons tubaires.

La tonsilla pharyngea hypertrophiée ne présente pas toujours l'aspect lobulé dont j'ai parlé, mais revêt quelquefois la forme d'une tumeur compacte et unie. Je citerai à cet égard le cas d'une jeune fille de quatorze ans, où cet organe hypertrophié possédait la configuration et la grosseur d'une forte cerise, à laquelle il ressemblait de plus, par sa surface tout-à-fait lisse. En bas, la tumeur était un peu étranglée par une rainure verticale. Il existait, dans ce point, une ouverture dans laquelle les instruments pénétraient profondement ; c'était évidemment l'entrée de la bursa pharyngea de Mayer. La tumeur se montrait bien isolée au milieu d'un pharynx d'apparence normale d'ailleurs et n'en touchait pas les parois latérales ; aussi n'y avait-il aucun trouble auriculaire et n'existait-il que la gêne dans la respiration nasale.

Je résume ce chapitre dans la

Conclusion No. 3.—L'affection porte toujours sur la tonsilla pharyngea et souvent, en même temps, sur les parois latérales du pharynx.

IV.

Les tumeurs adénoïdes constituent, à mon avis, une manifestation fréquente et importante de la diathèse lymphatique. Je ne crois pas que l'on puisse les imputer à une autre cause générale, par exemple la syphilis congénitale. J'ai constaté par plusieurs nécropsies d'enfants, auxquels était échu ce triste héritage, qu'elle n'a aucun rapport avec les végétations en question.

Comme d'autres manifestations du tempérament lymphatique qui portent également sur le tissu adénoïde (ou lymphoïde), ces tumeurs sont susceptibles de rétrograder d'elles-même à une certaine époque de la vie, mais trop tard pour permettre aux fonctions entravées par elles de recouvrer leur activité normale. Or, nous savons que les perversions fonctionnelles s'enracinent particulièrement vite dans l'enfance ; il faut donc intervenir de bonne heure pour empêcher qu'elles deviennent irrémédiables.

Aucun traitement général ne parvenant à faire disparaître ces végétations, il faut les attaquer chirurgicalement. De petits enfants même supportent facilement l'ablation de ces tumeurs, quand on a soin de n'employer que des méthodes prudentes et des instruments appropriés.

Le succès de l'opération est rapide, quant à certains symptômes ; aussitôt les tumeurs enlevées, la respiration nasale redevient possible, mais les autres troubles demandent du temps et souvent des soins spéciaux pour disparaître. Le succès est en outre durable, car, une fois enlevées ou seulement entamées,

ces végétations ne repoussent plus. L'effet de l'opération peut même augmenter par la suite, car souvent les restes des végétations qu'on a laissés s'atrophient d'eux-mêmes, comme je l'ai constaté maintes fois. On sait qu'une pareille atrophie secondaire arrive souvent après l'ablation des amygdales palatines, organes également riches en tissu adénoïde.

L'ensemble des faits que je viens d'exposer indique la ligne de conduite à observer. Il faut opérer le plus tôt possible, mais se borner à diminuer le volume des tumeurs dans une mesure suffisante pour rendre la respiration nasale possible et débarrasser la trompe d'Eustache. L'inspection rhinoscopique démontrera si ce dernier résultat est atteint ; le libre passage de l'air par les deux narines prouvera que la voie nasale est suffisamment dégagée.

S'obstiner à vouloir enlever tout ce qui est hypertrophique serait inutile, pénible pour le malade et même dangereux.

Ce qui s'est passé postérieurement à l'opération dans le cas que j'ai cité tout-à-l'heure, prouve qu'il suffit d'enlever le strict nécessaire des excroissances, en comptant sur l'atrophie consécutive à l'opération. Après avoir détruit à peu près les deux cinquièmes de la tumeur bilobée, le seul symptôme présent, la gêne de la respiration nasale, avait cessé. J'ai revu la jeune fille un an après l'opération et j'ai constaté, au rhinoscope, que le reste considérable du produit morbide que j'avais laissé, avait disparu sans la moindre trace. En même temps, le développement de la jeune personne avait pris un essor remarquable. D'autres cas m'ont présenté des phénomènes du même genre.

Ces faits se résument dans la conclusion suivante :

Conclusion No. 4.—L'ablation de toutes ces tumeurs doit être pratiquée le plus tôt possible ; on se bornera toutefois à enlever des portions suffisantes pour rétablir la perméabilité des fosses nasales et de la trompe d'Eustache.

V.

La nécessité d'opérer réconnue, il s'agit de choisir les procédés à suivre. Ici, il me semble indispensable d'établir des règles différentes pour les végétations qui résultent de l'hyperplasie de l'amygdale de Luschka et que d'après leur siége j'appellerai "médianes," et pour celles implantées aux côtés du pharynx nasal et que je désignerai sous le nom de "latérales."

1.—Quant aux tumeurs médianes, je pense que la plupart des procédés recommandés par les auteurs peuvent être employés à leur ablation. Il faut citer, parmi les instruments en usage, le galvano-cautère utilisé par M. Voltolini, le couteau annulaire de M. Meyer, et la pince tranchante que j'ai décrite, en 1878, dans la *Gazette des Hôpitaux*, et qui a été modifié à son avantage par plusieurs auteurs, surtout par notre distingué confrère, M. Woakes. Je mentionnerai de plus l'adénotôme de mon savant ami M. Delstanche, l'anse de fil de fer, employée comme écraseur et, en dernier lieu, la curette ou cuiller tranchante. Tous ces instruments peuvent être employés dans la région supéro-postérieure des arrière-narines, car la muqueuse qui la tapisse ne renferme aucun organe important que les manœuvres instrumentales puissent léser.

On ne saurait nuire au malade qu'en dépassant cette muqueuse en profondeur, ou bien en empiétant sur les parois latérales de la cavité. Le premier de ces dangers n'existera pas si l'on reste fidèle au principe posé plus haut de ne détruire que ce qui obstrue en faisant saillie dans le pharynx. Il est prudent également d'employer de préférence des instruments comme le couteau annulaire, les pinces tranchantes et l'anse qui agissent parallèlement à la surface interne de la cavité et ne sauraient pénétrer perpendiculairement dans les tissus comme cela peut bien arriver avec la curette trop fortement appuyée.

On sera sûr de ne pas empiéter sur les parois latérales si l'on n'opère que guidé par le miroir pharyngoscopique ou par le doigt, qui palpe en même temps

qu'il dirige et maintient l'instrument. Mais on n'insiste pas suffisamment sur le nombre considérable de malades qui tolèrent seulement l'exploration digitale rapidement faite ou le simple examen rhinoscopique, mais ne supportent nullement ces procédés combinés avec l'introduction d'un instrument quelque peu volumineux. Il est vrai que des exercices patiemment répétés amènent souvent une tolérance inespérée, et j'ai trouvé surtout chez les enfants une grande facilité à supporter l'examen rhinoscopique prolongé—mais il n'en subsiste pas moins des personnes réfractaires chez lesquelles il faut agir sans l'aide de l'œil ni du doigt. Dans ces cas, qui ne sont pas très-rares, on fera bien de suivre strictement mon conseil de n'employer que des instruments agissant parallèlement à la surface de l'organe et de se borner à opérer sur le milieu du pharynx. C'est dans ces circonstances aussi que les entonnoirs de M. Zaufal peuvent être très-utiles lorsque les fosses nasales permettent leur introduction, parce qu'ils nous dispensent de la rhinoscopie et permettent le passage d'un petit galvano-cautère ou d'une anse, guidés par l'inspection.

Quant au galvano-cautère, son usage est peu ou pas douloureux, pour peu qu'il soit contrôlé à l'aide du miroir pharyngoscopique. Comme le volume de l'instrument est minime, on peut souvent l'employer là où d'autres plus encombrants ne sont pas utilisables, soit que leur contact provoque des nausées, soit que leur volume cache une trop grande partie du miroir.

Je me sers de galvano-cautères courbés selon l'axe bucco-pharyngien et formés d'une tige de quatre millimètres d'épaisseur seulement, qui porte au bout une spirale de platine, large de deux à quatre millimètres. Rien de plus facile, même chez de petits enfants, que d'introduire ces instruments et de les porter, guidé par le rhinoscope, sur la partie à brûler. On évite ainsi de toucher les amygdales, la luette, le voile du palais et les parties saines du pharynx ; par conséquent, pas de constriction ni de cautérisation déplacée.

En opérant d'après ces principes, le galvano-cautère ne donne lieu à aucune irritation sérieuse ; je proteste donc contre l'idée que son usage soit dangereux. Il va sans dire qu'il n'en est plus ainsi lorsqu'on agit sans précaution, qu'on brûle à l'aveugle, c'est-à-dire sans rhinoscope, qu'on ne localise pas strictement l'action de l'instrument en profondeur et en étendue, ou que l'on emploie des instruments d'une taille et d'une puissance hors de proportion avec le but à atteindre, tels que le brûleur de porcelaine.

En cas de très-grande irritabilité de la gorge, on peut quelquefois introduire un galvano-cautère fin, droit et bien isolé par le nez et brûler ensuite, après avoir placé rapidement le miroir rhinoscopique.

2.—Si des procédés variés me paraissent applicables au traitement des tumeurs médianes, je ne saurais en dire autant pour les végétations placées latéralement. Vu l'exiguïté de l'espace sur les côté du pharynx, des instruments encombrants ou des manœuvres opératoires pratiquées sans rhinoscopie ni palpation, risquent de blesser gravement l'extrémité pharyngienne proëminente de la trompe d'Eustache qui occupe le côté de la cavité et vient se placer, pour ainsi dire d'elle-même, dans la sphère d'action de l'instrument. A cette occasion, je ne saurais trop louer l'esprit de franchise vraiment scientifique des auteurs qui avouent que pareil accident leur est arrivé, avec des instruments inventés, pourtant par eux, et dont ils possédaient naturellement le maniement mieux que personne.

En blessant la trompe d'Eustache, on provoque souvent une otite moyenne purulente, et je suis persuadé que cette conséquence fâcheuse—mais, à ce qu'il paraît, fréquente—de l'ablation des tumeurs adénoïdes ne reconnaît point d'autre cause que des imprudences de ce genre.

A mon avis, la meilleure méthode de se mettre à l'abri de ce danger consiste dans l'usage du galvano-cautère avec les précautions exposées tout-à-

l'heure. On respectera ainsi la trompe, tout en détruisant ce qui l'embarrasse ou l'étreint. Il en est ainsi non seulement pour les végétations des côtés du pharynx, mais aussi pour les parties latérales de la tonsilla de Luschka hyperplasiée, qui sont également difficiles à détruire autrement. Le procédé est excellent, de plus, pour combattre la forme particulière d'hypertrophie diffuse du pavillon tubaire que j'ai signalée dans un chapitre précédent.

Conclusion No. 5.—Les tumeurs résultant de l'hyperplasie de la tonsilla pharyngea peuvent être opérées d'après différents procédés; les végétations siégeant sur les parois latérales du pharynx, surtout celles qui avoisinent le pavillon de la trompe d'Eustache, seront détruites à l'aide d'un galvanocautère mince, guidé par le miroir rhinoscopique.

Adenoid Vegetations in the Vault of the Pharynx.

Dr. Guye, Amsterdam.

There are in the etiology and in the treatment of these vegetations a few points on which I would like to fix attention. (1.) As regards the etiology. The view to which my experience has brought me is that the adenoid vegetations are caused by chronic catarrh of the mucous membrane, and result from hypertrophy and swelling of the adenoid tissue which in the normal state is to be found as the tonsilla pharyngea (Luschka). In many cases it is difficult to say whether we ought to speak of hypertrophy of the tonsilla pharyngea or of adenoid vegetations. The simple catarrhal swelling produces a result of great importance, by impeding the nasal respiration, and the patient takes to the habit of breathing through the mouth, especially during his sleep. This circumstance, if not prevented with great care, becomes soon an aggravating feature of the disease. The inspired air, which ought to be purified and moistened by the mucous membrane of the nose, produces dryness and irritation of the pharynx, and increases the swelling of the nose, as the normal quantity of air is no longer passed through that organ. Therefore, the mechanical occlusion of the mouth during sleep, and in some cases, even in the daytime, ought to be an essential part of the treatment. This occlusion can be effected by a contra-respirator, which is simply a respirator which does not let any air pass. This part of the treatment is important against the development of the vegetation, and may prevent relapses after operation. As to the operation, I wish to advocate strongly the operation by the finger-nail, without any instruments, for the great majority of cases. The cases where this method is insufficient are rare exceptions. This method has the advantage of being always applicable even in children in the first years of life. I wish, in addition to these remarks, to say a few words on the frequent coincidence of adenoid vegetations in the vault of the pharynx with chronic catarrh of the conjunctiva. During the last two years, I have, conjointly with Professor Snellen, seen a number of such cases. The first case which came to my notice was that of a young lady from Haarlem, about fifteen, who had been under Professor Snellen's treatment for chronic follicular catarrh of the conjunctiva. She came to me with a swollen nose, the mouth more than half open, her voice being both hoarse and nasal. Professor Snellen had advised her to submit to my treatment of her throat and nose, and had said to her that, when these were cured, he expected that her eyes would get all right of themselves. I own that I was rather astonished at first, and regarded the prediction sceptically. However, I found enormous adenoid vegetations, which I scratched out once a week four or five times. I prescribed injections into the nose, and made her

wear a contra-respirator at night. In a few weeks the case went on very well, the voice was improved a great deal, and the eyes really got all right, thoroughly in accordance with Professor Snellen's prediction. Professor Snellen had been struck by the frequent coincidence of the so-called follicular conjunctivitis with the pharyngeal and nasal adenoid vegetations, and he thought it likely that the diseased state of the nasal mucosa might have an influence on the conjunctiva, either by producing irritation and lacrymation of the eye by reflex action or perhaps through the direct connection of the lymphatic systems of both mucous membranes. Since that time I treated a number of Professor Snellen's patients, generally with good results both in regard to the general health and to the cure of the follicular conjunctivitis. I remember, *e.g.*, three children of one family in Utrecht, who all three had been for the last two years under treatment for their eyes, having a follicular catarrh of the conjunctiva. They had all of them enormous vegetations in the vault of the pharynx, with more or less impaired hearing. One of them, the eldest, a girl of about thirteen, had a purulent inflammation of the left tympanic cavity, with perforation of the membrane and otorrhœa for three or four months. She had been suffering from earache and fever now and then during the last winter. She had not been much improved by a local treatment of the ear. Scratching out the adenoid vegetations did a great deal of good to all three of the patients. Their hearing got restored, they could again breathe freely through the nose, whilst the mouth was kept closed by a contra-respirator at night; the general health greatly improved, and in a couple of months the conjunctiva of the eldest was quite, that of the others nearly, cured. I might record a larger number of cases, some of which are still under treatment, but I do not wish to be tedious. I think the subject deserves highly the attention of ophthalmic surgeons, who, moreover, are well aware of the influence on the conjunctiva of nasal catarrh and swelling and obliteration of the lacrymal duct. Galezowsky, for instance, devotes a long chapter to his "Conjonctivite Lacrymale." In my opinion that disease may in many cases be found complicated with, and perhaps caused by, adenoid vegetations in the vault of the pharynx; and the thorough means of curing dacryocystitis may require, besides local treatment, the scratching out of the tonsilla pharyngea. Hardness of hearing is so frequent a symptom of adenoid vegetations, that it is in most cases the reason why such patients seek treatment; and if the aurist whom they consult is not alive to the frequent occurrence of adenoid vegetations as the cause of the disease, his treatment will be of little, or at least of no durable, result. If I am not much mistaken, when the eminent and distinguished surgeons who treat and observe diseases of the eye have given to the subject due attention, they will not be long in finding a large number of cases where the adenoid vegetations of the vault of the pharynx play an important etiological part.

On Papillo-Adenomatous Disease, or Post-Nasal Vegetations.

Dr. E. Woakes, London.

The following remarks are based upon an experience of upwards of 100 cases of the disease, which have occurred in my hospital and private practice during the last five years. I have given in a tabulated form the details of eighteen of these. The general features of all resemble each other so nearly that it seems unnecessary to add to this number.

Pathology.—In the account of this disease which I have already published*

* Vide chap. iii. "On Deafness," &c., second edition.

I have stated the grounds which lead me to consider these growths to be papilliomatous in their origin, though owing to the nature of their situation and general environment, they acquire a more pronounced mucous membrane envelope than do papillary developments from mucous membrane in other situations. The position which I incline to adopt on this point is as follows:—

The point of departure in the morbid process resides in the papiliæ, some of which assume hypertrophic growth of very considerable proportions. This is evidenced by the solid fibrillar structure of the centre of the growth, which immediately surrounds the artery and vein entering at its root, and which modified connective-tissue structure is continued through the excrescence to within a short distance of its periphery. Outside this, and passing insensibly into it, is a thick stratum of mucous membrane proper: although proper mucous cells are met with in this outer layer, I have never been able to trace anything like a duct follicle, such as would imply the presence of gland tissue proper in any specimen examined. This fact seems to imply that the starting-point of the disease is not in the follicles or any special gland structure to be met with in the post-nasal space.

True papillomata are met with in the adjacent regions of the throat and larynx not infrequently; such a specimen, *a*, which I removed very recently from the left arch of the palate is here exhibited, others from the vocal cords *b*, *c*. My contention is, that these, growing on a comparatively free surface, develop normal papillomata; while their congeners in the post-nasal space, which in infancy and childhood is very limited, crowd and compress each other; and, being constantly bathed in retained secretion, they become softer and smoother than do growths of a similar origin occurring elsewhere.

Another point of perhaps more importance in connection with the pathology of the disease is that in quite a large proportion of my cases there was to be found a very marked development of the mucous membrane of the locality. This hypertrophied mucous membrane was usually found on the posterior and lateral walls of the pharynx, immediately behind the soft palate, where it assumed occasionally quite a corrugated condition, the folds so caused encroaching largely upon the orifices of the Eustachian tubes. In some of these instances the vegetations were seated high up in the vault, and in others they were present to a very slight extent only, the chief cause of the symptoms being due to the corrugated and thickened mucous membrane.

So far as I have been able to form any opinion of the cause of the foregoing condition, it has seemed to be due to increased blood supply of the part, consequent upon the presence of the growths, leading to the ordinary consequences of hyper-nutrition.

Etiology.—That the disease may be congenital is to be inferred from the fact that I found them in an infant of nine months; and have operated on another somewhat over two years of age, who had exhibited indications of their presence from birth. In every case of so-called "snuffles" they should be looked for, as the foregoing experience indicates that this symptom is occasionally due to their existence thus early in life. On the other hand, some of my patients have referred the initiation of the disease to an attack of one of the exanthemata—that is to say, the subject or his friends were unconscious of any nasal trouble till after an attack of measles or scarlet fever, on recovery from which the symptoms commenced.

Heredity is, no doubt, an important factor in predisposing to the disease. Vaso-motor pareses in the areas of the cervical ganglia are very distinctly transferable from parents to their offspring; but, having treated of this in another communication, this passing allusion to it as a potential cause of hyperplasias must suffice.

As regards inherited syphilis, my experience points to it as evidence of a remote sequence of the disease rather than to a recent infection.

That there is a distinct tendency for these vegetations to disappear in adult life there can, I think, be little doubt. I have only met with them once or twice after the age of twenty-five years. As I have elsewhere expressed the opinion, this is due to the increase of space in the naso-pharyngeal region, which takes place here in common with the rest of the facial framework as development approaches completion. This "implies freer access of air, readier escape of secretions, and, consequently, greater dryness of the surroundings generally. The soil thus drained and ventilated appears unfitted for the vegetations to flourish upon, and they accordingly disappear."*

It is, however, most undesirable that the patient be left to this issue for reasons irrespective of those immediately due to the disease, and belonging to the locality primarily affected; because the obstruction to nasal respiration, induced by the growths, means that the air inspired by these patients is drier, colder, and less free from impurities than it should be, and so predisposes them to lung affections of an inflammatory type. Also, from this cause, as well as probably from reflex irritation of the vagus nerve, to asthma, which in children is an occasional concomitant of the disease. Further, they maintain a low state of vitality in the regions implicated, which predisposes to frequent sore throats and tends to establish enlargement of the tonsils. Should these patients become the subjects of the exanthemata, especially of diphtheria, their symptoms are more severe, and show a less tendency to yield to treatment, than where such complications do not exist. Thus, these subjects are handicapped against recovery from illnesses which are the common lot of the younger representatives of the race.

On these grounds, if on no other, the removal of the growths, as soon as discovered, becomes imperative.

The symptoms most generally present are modification of the voice, so that it assumes a nasal twang, in which the letters *m* and *n* are pronounced as *b* and *d* respectively; buccal respiration, obliging the patient to breathe through his mouth, and keep it open during sleep, during which time he usually snores. Chronic pharyngitis is commonly set up in consequence of this condition. All these symptoms, referable to obstructed nasal respiration, have attained much less marked degrees of intensity in the cases observed by myself, than in those reported from the Continent. The degree of flux from the anterior or posterior nasal orifices is also very liable to vary; in most cases some catarrh exists, and when, as occasionally happens, the patient is unable to blow his nose, the discharges are apt to collect in the posterior nasal space or trickle from the excoriated nostrils, adding much to the discomfort as well as to the disfigurement of the patient.

I have not noticed loss of taste or smell, though it is conceivable that these senses would be interfered with where extreme occlusion of the nasal fossæ exists. Neither have I seen deformity of the chest walls as presented in a proportion of Löwenberg's patients. Night sweats have obtained in a number of my cases, and may be accounted for probably by the complementary activity of the skin acting as a set-off to the impediment of respiration.

Interference with the *organs of hearing*, inducing more or less deafness, is the most frequent, and to my mind the most important, of the direct lesions resulting from the disease. Not more than five per cent. of my cases have escaped this complication. The severity of the ear mischief will depend largely upon the situation of the vegetations. Thus a very extensive develop

* *Op. cit.* p. 38.

ment of these in the vault of the pharynx interferes less with the function of the Eustachian tubes than does a much smaller amount seated upon the posterior wall of the pharynx. In this latter situation a single growth will be frequently complicated with that hypertrophic thickening of the mucous membrane already alluded to, and which must be dealt with step by step with the primary disease, inasmuch as it proves quite as detrimental to the function of the tubes as the latter.

As regards the nature of the *ear affections* induced by the foregoing conditions, they offer no special characteristic by which to distinguish them from other affections of the organs of audition, having a faucial origin—that is to say, if catarrh is the prominent symptom of the throat affection the tendency is for this to involve the Eustachian tubes and tympanic cavities. Suppuration and perforation of the membrana tympani, with polypus or polypoid granulation, and, in short, all the sequences of confirmed otorrhœa, are most frequently seen under these circumstances—*i.e.*, when the vegetations affect mainly the vault. On the other hand, when a fewer number of vegetations accompanied with extensive augmentation of mucous membrane are seated on the posterior wall of the pharynx, implying a complete mechanical occlusion of the tubes, the form of ear disease ensuing hereon is more apt to assume the condition known as chronic non-suppurative inflammation of the middle ear with collapse of the drum membranes and severe degrees of deafness. The latter is far more tedious and difficult to treat than the former, and the chances of complete recovery of hearing power are less in it than when the grosser phase of suppuration is present.

The *diagnosis* of post-nasal growths is by no means difficult. If a patient presenting the indications of nasal obstruction be inspected with reference to the state of the faucial region, the soft palate will usually be seen to project somewhat forwards, imparting a greater depth to the space between it and the posterior wall of the pharynx.

In young children rhinoscopy is usually abortive, and palpation, or examination by the finger, should be employed without delay. If the examiner possess the *tactus eruditus* of experience, he will be able to pronounce definitely as to the existence of the disease. If performed skilfully, the proceeding is not very painful, and occupies a few seconds only. Instead of a clear space with its well-defined landmarks, a soft irregular mass is encountered, which bleeds on contact with the finger and more or less occupies the region. At other times the digit encounters the obstruction immediately behind the velum, after passing which the vault on either side the fornix is found perfectly free.

As regards differential diagnosis, the disease most likely to give rise to doubt is hypertrophy of the pharyngeal tonsil. Besides being a much rarer disease than that under review, its tactile indications are distinctive, as it is much firmer and more uniform in outline than are the mass of vegetations. In a marked case of this kind at present under my care the rhinoscopic evidences were conclusive. These were, a solid looking rounded mass filling up the vault, overlapping the choanæ in front for the distance of the third of an inch, and laterally filling up Rosemuller's fossæ, so as to come in contact with, and press upon, the protuberance of the Eustachian orifices. In the median line there was a faint indication of division, and in this line were two deep crypt-like depressions. These latter were quite unintelligible to me at first, but as the mass diminished under treatment, these fossæ enlarged and at length merged in each other, showing them to be simply gaps left between the swollen halves of the gland where the latter did not quite come into apposition. The patient who presented the foregoing condition was an intelligent lad of

fifteen, who four years previously became subject to deafness, the starting-point of which was a severe cold. The deafness varied considerably, but he never had otorrhœa. A year ago he was at school at Heidelberg, where he was treated chiefly by Politzer's inflation, but without benefit. Within the last few months he has had frequent attacks of epistaxis, which now occur almost daily. On examination, May 11, 1881, he presented, besides the foregoing rhinoscopic appearances—and in his tolerance of the mirror he formed a happy exception to the generality of young subjects—a considerable amount of rhinitis, the mucous membrane of the inferior turbinated bones being swollen and spongy, so as to obliterate the lower nasal channel on each side. H. D. right $\frac{9}{40}$, left $\frac{2}{40}$. He has tidal tinnitus in both ears, with occasional giddiness, and both memb. tymp. are depressed and dull-looking; Eustachian tubes impervious. The treatment consisted in application of the galvano-cautery to the spongy Schneiderian membrane, after which the nostrils were lightly packed with terebinth wool night and morning; nitrate of silver was applied freely to the pharyngeal tonsil. Later on iodoform wool was substituted, being applied as far back as possible. The bleeding was rapidly cured, the pharyngeal swelling subsided, and after local treatment of the ears the deafness also disappeared.

In my former essay on this subject I stated that nasal polypus is scarcely likely to be a source of confusion, inasmuch as it rarely occurs at an age when papillo-adenomatous disease is most frequent. Since giving expression to the above, however, I have met with two cases which necessitate a modification of this view. Both were somewhat peculiar, because, besides the readily perceived antero-nasal polypi, there was almost uniform cystoid degeneration of the mucous lining of the post-nasal space, a condition calculated to deceive the touch, and which without the exercise of due care might convey the impression that the case was one of post-nasal growths. Both these patients were between thirteen and fifteen years old, and in the elder boy the disease dated from birth. The bridge of the nose was much flattened, from spreading of the nasal bones outwards in consequence of the pressure from within during their plastic state in very early life. Examination revealed extensive superficial necrosis of the bony structure of the nose, and it was found necessary, in order to remove the diseased tissue, to lay open the nasal fossæ by dividing the attachment of the cartilage of the nose through the inside of the upper lip. This gave room for the manipulation of instruments with which to remove the necrosed portions of the nasal aspect of the superior maxillary bone and the middle turbinated bone—the lower turbinated had already disappeared in the mass of diseased tissue that surrounded it. Subsequently the galvano-cautery was freely applied to the entire region dealt with—up to the present the left side only—with the result, as yet, of completely removing the disease. I have given the above details as well for their diagnostic value in relation to the disease under discussion as for the interest attaching to the extensive exfoliations of bone in consequence of the cystoid degeneration of its lining membrane, which are unique in my experience of non-syphilitic disease of this region in young subjects.

Treatment.—Several cases treated in my clinic have been so far relieved by the use of alkaline nasal washes that they have declined further interference. These were of course only the mildest in degree. Two or three others have recovered by the application of caustics—London paste, nitrate of silver in the solid form, followed subsequently by solution of chloride of zinc. All the others have been dealt with instrumentally. Since becoming acquainted with the forceps designed by Dr. Löwenberg, I have practically rejected every other in their favour—that is to say, in favour of his instrument modified to meet my requirements, by adding a cutting edge to the posterior aspect of the blades. By means of this addition one is enabled to seize

TABLE OF CASES OF ADENOID VEGETATIONS IN THE VAULT OF THE PHARYNX.

Dr. E. WOAKES, London.

No.	Name.	Age and sex.	Date of attendance.	Prior duration of symptoms.	Posterior nasal space.	Nasal passages.	Deafness and nature of ear affection.	Additional symptoms.	Treatment.	Whether other members of family affected.	Result.—Remarks.
1	Archibald Treherne.	2½ yrs. M	1877 Dec. 18.	From birth.	Numerous growths on posterior wall of pharynx, visible on raising velum.	Excoriated.	...	Obstructed respiration; disturbed sleep.	Growths crushed with long thin curved dressing forceps. Vin. fer., ol. morrhuæ. Garg. pot. chlorat. ung. zinc. benzoat. to nostrils.—Operation c. anæsthesia.	...	Cured.
2	Alice Rawe.	16 yrs. F	1879 June 6.	Deafness 1 month, probably longer; several children being deaf, not noticed earlier.	Extensive mass of growths, and hypertrophied tissue from vault to tubes.	Occlusion of right from displacement of septum; rhinitis.	Deafness increased of late; extreme depression of both membrana tympani; obstructed Eustachian tubes.	Snores; dyspnœa on exertion, but not marked; buccal respiration; keeps her mouth open.	Several operations; first with cutting ring, afterwards with Löwenberg's forceps; nasal bougies to dilate passages; was under observation till May, 1880. Politzer's process, catheter. Lot. sodæ carbol.; mist. fer. et quin.	2 other children also.	Cured; recovered good hearing power for voice.
3	Mary Anne Platt, sister of Alice Rawe.	23 yrs. F married.	1879 May 16.	Several years' ear trouble.	Free from growths at present time; catarrhal.	Nasal and posterior nasal catarrh.	Deaf, right; granular polypus occupying right fundus; detached and necrosed manubrium presenting on face of polypus.	...	May 28, 1879. Polypus removed with necrosed manubrium. Guttæ plumbi diacet.; lotio sodæ carbol. to nose and ear. Mist. fer. co.	2 others; history left no doubt of early existence of growths which had disappeared when seen first, but to which ear symptoms were due.	November, 1879; cured, with permanent perforation of membrana tympani, and some deafness of right ear.
4	Albert Rawe, brother of 2 and 3.	14 yrs.	1879 May 16.	2 years.	Vault and entire posterior nasal space occupied with growths, granular pharyngitis and enlarged tonsils.	Catarrhal.	Very deaf; H. D. right, 5 inches; left, 3 inches; both membrana tympani depressed; manubrium and plicæ injected; obstructed Eustachian tubes.	Snores; keeps his mouth open; voice but slightly affected.	Lotio sod. carbol. to nose and ears; zinc. chlor. to pharynx. Politzer's pr. catheter.—September 19, 1879, admitted; first operation, September 25.—November 3, made out-patient. — Second operation, October 23, 1880.—February 6, third operation; afterwards treated with gut. arg. nit. gr. vj to ℥j; and catheter.	2 others.	Growth cured; attended for deafness till May, 1880, when he could hear fairly well.
5	Florence Liddal.	10 yrs.	1879 Sept. 30.	3 years.	Extensive growths, chiefly in vault; enlarged tonsils.	Right nasal bone enlarged; nasal passages sore, much discharge; excoriated extensively.	No observable deafness; no chest deformity.	Voice, nasal.	Lotio sod. carbol. to nose.—Admitted October 8.—October 14, tonsils removed and some growths.—October 21, second operation, c. anæsthesia.	Other children free.	Remained under treatment till March, 1880, chiefly for bronchial catarrh; cured.

6	Maude Henderson.	9 yrs.	1881 Feb. 8.	2 years, after scarlet fever.	Very extensive growths, filling posterior nasal space.	Complete obstruction, buccal respiration.	Quite deaf to conversation; hears only when shouted at.	Voice, nasal; night sweats; no chest deformity.	Lotio sodæ carbol.; mist. fer. quin.—March 11, admitted; operation same day; very extensive removal from entire space; much hæmorrhage, requiring posterior space to be plugged, also anterior, with tannin wool. Made rapid recovery. Politzer's pr.—March 12, T. 101·6; P. 124.—March 13, T. 99·4; P. 120.	...	May 20 cured; hears whispering voice; anæsthesia.
7	Ellen E. Allcock.	7 yrs.	1880 Sept. 21.	9 months, probably longer.	Vault and posterior wall.	Partially obstructed.	Very deaf; membrana tympani retracted.	Discharge excoriated.	Lotio sod. carbol. for nose.—September 28, 1880, admitted. Politzer's pr.—October 8, 1880, first operation.—October 19, second operation.—Discharged October 26, then made out-patient. Operations c. anæsthesia.	...	May 17, 1881, cured; membrana tympani somewhat flat; hears well.
8	Henry Newsham.	14 yrs.	1879 July 4.	Several years. (Subsequently stated to have existed 7 years.)	Entire posterior nasal space; hypertrophied and inflamed follicles on posterior wall of pharynx.	Quite obstructed on right side; great thickening of inferior and middle turbinated bones.	Very deaf; Eustachian catarrh; left tube pervious; right, closed; m.t. thickened and retracted.	Buccal respiration; nasal voice.	Lotio sodæ carbol. and pot. chlor. to nose; catheter.—September 23, 1879, admitted.—September 26, first operation; with anæsthesia.—Out-patient, October 2.—October 21, readmitted.—October 23, second operation; with anæsthesia.—Out-patient, November 7, 1879; continue lotion and catheter.—February 6, 1880, 2 growths reappeared and removed; no anæsthesia.—March 9, 1880, 2 growths reappeared and removed; no anæsthesia.—June 26, 1880, readmitted; third time; fifth operation; space again cleared; with anæsthesia.—July 17, 1880, out-patient.—October 15, London paste to growths.	...	November 19, 1880; left to join his father in Ireland. In this case growths obstinately recurred; was improving in health and hearing power; left Eustachian tube was free, right partially so. Relieved.
9	William Beccroft.	13 yrs.	1880. Jan. 23.	6 months.	Growths on vault and on posterior wall.	...	Otorrhœa; left membrana tympani depressed and thickened; manubrium resting on promontory. Right membrana tympani has interstitial deposit, and front of manubrium perforated.	...	January 23, 1880, lotio sod. carbol. to nose and ears.—January 30, some growths removed; no anæsthetic; zinc. s. gr. vj to ℥j to ears; Politzer's pr.—March 5, second operation; no anæsthetic.	One sister.	Much better; discontinued attendance; the father being a coachman had to leave London.

No.	Name.	Age and sex.	Date of attendance.	Prior duration of symptoms.	Posterior nasal space.	Nasal passages.	Deafness and nature of ear affection.	Additional symptoms.	Treatment.	Whether other members of family affected.	Result.—Remarks
10	Louise Becroft.	4 yrs.	1880. Feb. 27.	Several weeks.	Vault extensive.	Embarrassed nasal respiration, especially at night.	Not deaf.	Voice thick.	March 6, 1880, admitted; operation; anæsthesia; lotio sod. carbol. to nose.—March 11, discharged.	One brother, as above.	Cured. Passed from observation on 19th of March; same reason as above; could breathe perfectly.
11	Louisa Haffleman.	9 yrs.	1879. Aug. 29.	Several years.	Vault and posterior wall.	Post-nasal catarrh.	Some deafness; tubal catarrh.	Hypertrophied tonsils, right worst.	August 29, 1879, lotio alum. ʒj, catechu ʒss, aq. ʒx for nose. Politzer's pr.—January 13, 1880, in-patient; operation with anæsthesia; right tonsil also removed. February 15, discharged.	...	Cured.
12	William Hill.	9 yrs.	1880. June 29.	3 months.	Vault.	Post-nasal catarrh.	Slight deafness.	...	Lotio sod. carbol. to nose; Politzer's pr.; mist. pot. chlor. ammon. c. cinchon.—August 20, in-patient; operation with anæsthesia.—September 3, discharged.	...	Greatly relieved.
13	Margaret Faber.	8¼ yrs.	1879. Dec. 5.	Several years.	Prominent in middle line, with much thickened tissue in neighbourhood of Eustachian tubes.	Very deaf, right chronic inflammation of the middle ear, with perforation of posterior left ditto. Eustachian tubes pervious, but catarrhal. In January, 1880, left middle ear became acutely inflamed.	Otorrhœa in both.	...	December 5, 1879, lotio sod. carbol. to nose and ears.—January 2, 1880, guttæ zinc. s. gr. vj to ʒj. Politzer's pr.—February 6 to January, 1881, growths removed with anæsthesia; lotio alum. ʒj to ʒx; Politzer's pr.; when acid. boracic. insufflated; lin. ammon. c. opio behind ears.—February 12, in-patient; operation to remove thickened tissue from tubes; ether and chloroform. February 25, discharged relieved. [N.B.—After operation in February, 1881, T. rose 102°, P. 120°. Tr. acon. mj, col. et rhei purge; rapidly reduced.	...	April 1, 1881. Nearly well, but still under treatment. Very little benefit resulted from removing growths, but when the hypertrophied tissue from tubes was removed hearing rapidly improved.
14	Frederick Owen.	13 yrs.	1881. Feb. 8.	1 year.	Vault and posterior wall; follicular pharyngitis.	Displacement of tip of nasal septum to the right; posterior nasal catarrh.	Not very deaf.	Laryngitis; obstructed nasal respiration; sleeps with mouth open; snores.	February 8, 1881, lotio sod. carbol. to nose; vap. benzoin. ung. zinc. chlor. to pharynx and larynx.—March 11, in-patient; operation; amount of growth and tissue removed with anæsthesia proportionately small.—March 22, breathes freely and hears quite well.—April 19, sleeps with mouth closed.	...	Cured.

15	Adelaide Lanigan.	8 yrs.	1881. Feb. 15.	4 years.	Vault and posterior wall extensive.	Catarrhal.	Very deaf to ordinary voice, manubrium on promontory; Eustachian tubes open to Pol. pr.	Hypertrophied tonsil; health delicate; obstructed nasal respiration.	February 15, 1881, lotio sod. carbol. to nose.—February 22, ol. morrh., vin. fer., zinc. chl. to pharynx and tonsil.—March 9, in-patient.—March 11, operation with anæsthesia; much tissue and growths removed; mist. amara.; Politzer's pr.—March 15, discharged; out-patient.	...	Cured. Under treatment for general health; hearing improves daily.
16	Charles James Page.	9 yrs.	1881, Mar. 25.	8 years.	Vault and posterior wall.	...	Deaf; tinnitus at night. Occasional vertigo. H. D. right, four inches; left, three inches, both membrana tympani depressed; funnel-shaped anterior.	Hypertrophied right tonsil; night sweats.	March 25, 1881, lotio sod. carbol. to nose and ears.—April 6, operation; Politzer's pr.; out-patient.—April 22. H. D. both 7 in.—May 6, improving.		
17	Arthur Preston.	5 yrs.	1881. April 1.	2½ years.	Vault; hypertrophied tissue of posterior wall.	Posterior nasal catarrh.	Very deaf; otorrhœa both; granulation polypus occuping inferior half of the left membrana tympani.	...	April 1, 1881, lotio sod. carbol. to nose and ears.—May 1, in-patient.—May 11, operation with anæsthetics; growths and thickened tissue removed from posterior wall of pharynx.		
18	John Belson.	13 yrs.	1881. May 6.	18 months.	Growths on posterior wall.	Obstructed respiration.	Very deaf. H. D., right, three inches; left, one inch; both membrana tympani depressed, right injected anteriosly.	Hypertrophied tonsils; sleeps badly, and snores loudly.	May 6, 1881, lotio sod. carbol. to nose, garg. alum. fer. to pharynx.—May 20, mist. fer. quin. cit.—May 27, in-patient.—May 30, operation with anæsthesia; largish growth removed from behind velum, and much thickened tissue.—June 7, out-patient; repeat.	...	Cured. June 24. Hears quite well. Membrana tympani normal; breathes freely through the nostrils; sleeps well, and does not snore.
18	Jane Head.	21 yrs.	1879. Sept. 16.	2 years.	Growths on posterior wall; posterior nasal catarrh.	Catarrh.	Slight deafness in left ear.	Slight enlargement of right tonsil.	September 16, 1881, lotio sod. carbol. to nose; mist. fer. quin. cit.; Politzer's pr.—October 14, right tonsil removed; zinc to pharynx.—December 2, London paste to granulations.—December 12, Politzer's pr., and applications till June, 1880, when she was discharged.	...	Treated throughout as out-patient; paste reduced granulations, which were very accessible. Cured.

such of the vegetations as grow on the posterior wall of the pharynx, and more especially to remove portions of thickened tissue above referred to as of frequent occurrence in this locality. I regard this latter proceeding as equally imperative with the removal of the growths; as when this is superadded to the latter it forms a greater obstruction to the tubal function than do the vegetations, and no improvement will result to the hearing power if the operation be limited to their ablation. For this latter purpose I have occasionally used the galvano-cautery knife and have found it very efficient for the purpose. As a rule, I find it desirable to administer anæsthetics, because the operation can be more efficiently performed, especially in young children, when the patient is under their influence. Under these circumstances one operation will frequently suffice for the entire removal of the disease, and it has the further advantage, from its thoroughness, of rendering any after-treatment, by caustics, &c., unnecessary. For the purpose of anæsthesia in young subjects, I prefer a mixture of one part chloroform and three of ether to any other. In two cases hæmorrhage occurred which required measures for its restraint, and in one of these plugging the posterior nares was had recourse to. Very frequently it happens that, with the removal of the cause, the deafness gets well of itself. But where the auditory apparatus has undergone lesion, in consequence of long-existing catarrh or obstruction of the tubes, this lesion will require treatment on generally recognized principles.

DISCUSSION.

Dr. Michel, Cologne: I cannot agree as to the necessity of after-treatment in order to prevent recurrence, for I myself have never seen recurrence. I would rather believe that if digital exploration only is made, pieces remain unobserved, are not removed, and are later looked upon as recurrences. The use of a contra-respirator I consider only indicated after everything is removed. I understand by "everything" all that is projecting from the posterior wall, and is large enough to be caught. It is positively necessary to remove all that, if it is wished to get rid of all symptoms of impeded respiration, profuse secretion, inarticulate speech, &c.

Dr. E. Fränkel, Hamburg: I desire to speak on some etiological and therapeutical points. In the first place, I agree with Dr. Meyer with regard to the influence of the climate upon the development of the disease. I have had the opportunity of making observations on that point, having formerly lived in Silesia, where the disease is rare, and dwelling now in Hamburg, where not only is it much more frequent than in my former abode, but where it might be ranked among the more common diseases. In a somewhat considerable proportion of the cases the affection is congenital, as can be ascertained by anatomical investigation, after Schalle's method, of the naso-pharyngeal cavity of children who died from other diseases. Sometimes a spontaneous retrogressive change takes place in these cases later on. In the smaller proportion of the cases of adenoid vegetation the affection is, according to my observations, acquired and to be traced to catarrhal processes of the naso-pharyngeal cavity. The unfavourable influence of the vegetations upon certain general diseases, especially upon diphtheria, is a fact not to be lost sight of. Under these circumstances, very frequently the local affection becomes much more extensive, and the false membrane has a tendency to extend into the nose. As regards treatment, I consider the exclusive employment of the galvanocaustic method much too one-sided; certain forms belong, it is true, to its domain; others can certainly be operated upon by different methods —*e. g.*, by the cold wire, sharp spoon, &c. The galvanocaustic method

does not positively prevent recurrence. In conclusion, I wish to mention the occurrence of a disagreeable incident after the employment of the galvano-caustic method, which consists in a tonic spasm in the region of the sterno-cleido-mastoid muscle, which sometimes disappears after a few hours, sometimes lasts for several weeks. I am unable to give any explanation of this occurrence.

Dr. Böcker, Berlin: I fully agree with Dr. Meyer's arguments, and only wish once more to direct attention to the fact that in many cases the relationship is not such that the enlargement of the pharyngeal tonsil is dependent upon a chronic catarrh in the naso-pharyngeal cavity; but that the congenital tonsil produces and maintains the catarrh by its augmented secretion. If an opportunity be afforded of examining the naso-pharyngeal cavity of many small children who are brought to the surgeon on account of dyspnœa, keeping the mouth open, &c., the conviction will be arrived at that in most of these cases the cause of this state of affairs is to be found in a congenital pharyngeal tonsil. I have operated upon such vegetations in children as early as the age of three months—*i.e.*, I have crushed them with my finger, and postponed the final operation till a later period. I think that in future more attention should be paid to this point—viz., that a congenital tonsil produces catarrh, and that the naso-pharyngeal cavity should be properly examined in these cases.

Dr. Hopmann, Cologne: My experience in this question is based upon an observation of fifty-eight cases, thirty-three of which were operated on. The youngest patient was seventeen months, the oldest thirty-six years. In two-thirds of all the cases hyperplasia of the pharyngeal tonsil in the form of moderately sized knobs, plates, and peg-like processes was present. In the remaining third an excessive proliferation, not only of the tonsil, but in several cases also of the whole adenoid tissue of the superior pharyngeal cavity, quite apart from the tonsil, was observed. Most of these cases were complicated by considerable hypertrophy of the palatinal tonsils. I should like to propose the name of "adenoid tumours of the vault of the pharynx," this name being more comprehensive than the one now in use, "hypertrophy of the pharyngeal tonsil." As to treatment I have used wire loops, forceps, finger-nail, and sharp spoon, according to the circumstances of the case. In 1873, in which year I first operated, I used the galvano caustic écraseur, in the form recommended by Professor Voltolini, especially for the operation of the palatinal tonsil. As I soon found, however, by experience that when the loop was simply tightened the pieces of the growth remained in it, even before the current was passed through the wire, I generally use only the cold wire, and employ the heated wire only in the excessive forms which are distinguished by the development of fibroid tissue in the bases of the tumour. In conclusion I wish to draw attention to the fact that in the case of larger tumours, in which frequently adhesions of the single proliferations between each other and especially between them and the posterior wall of the pharynx exist, the operation is greatly facilitated by a previous separation of the adhesions by means of the finger-nail, or of an appropriately curved little knife, which is introduced parallel and close to the posterior wall up to the base of the skull, and which is moved from side to side.

Dr. Meyer replied, urging the diffusion of the knowledge of so serious a malady, and of the means of contending with it.

Dr. Loewenberg, in his reply, dwelt especially on the prophylactic treatment.

Die Natur und Behandlung der Ozæna.

Dr. B. Fränkel, Berlin.

Wir nahen dem Schlusse unserer Verhandlungen und es bleibt uns noch die Besprechung eines Leidens, durch welches die Natur in vom teleologischen Standpunkt aus ungerechtfertigter Weise den Sitz eines höheren Sinnes so entarten lässt, dass er denselben Sinn anderer Menschen in der erheblichsten Weise belästigt. Wir haben noch über Ozæna zu verhandeln und werden wir wohl alle unserem Comité dankbar dafür sein, dass dieser Gegenstand auf unsere Tagesordnung gesetzt worden ist, denn die Ozæna hat in der letzten Zeit im Vordergrund der Discussion gestanden, und will ich versuchen, die Fragen zu präcisiren, die besprochen wurden und voraussichtlich auch den Gegenstand unserer heutigen Discussion bilden werden.

Da ist zunächst der Name, Ozæna, ehrwürdig durch sein Alter und klar in seinem Begriff. Ozæna sind Nasenleiden, die stinken. Weiter aber sagt der Name nichts. Er bezeichnet lediglich ein Symptom, wie Husten, Zahnschmerzen, Diarrhöe und ist an und für sich nicht geeignet in unser auf anatomisch-ätiologische Gesichtspunkte gegründetes nosologisches System als eine Krankheit *sui generis* eingefügt zu werden. Es entsteht die Frage, sollen wir nun denselben ganz aufgeben, oder durch unsere Epitheta geeignet machen, für uns eine stringente Bezeichnung zu werden? Das ist zunächst eine unserer Discussion unterliegende Frage!

Aus dem grossen Bereich von Krankheiten, in denen Gestank aus der Nase beobachtet wird, verdient zunächst eine Form unsere Beachtung, in welcher sich keine Erkrankungen der Knochen, keine Ulcerationen oder dergleichen tiefere Erkrankungen, wohl aber der Gestank in der exquisitesten Weise findet. Es gehört diese Form dem atrophischen Catarrh an, wie die makroskopische Beobachtung der Schleimhaut und die sich immer mehr häufenden mikroskopischen Untersuchungen ergeben. Bei dieser Form finden sich dicke, eingetrocknete Borken, welche stinken und an welchen der Gestank haftet. Sie bestehen aus untergehenden Gewebstheilen und Micrococcen und füllen zuweilen die ganze Nasenhöhle aus. Ich glaube, es genügen diese Andeutungen, um in diesem Kreise das Leiden zu charakterisiren. Es entstehen dabei die Fragen: Sollen wir fernerhin nur noch diese uns am häufigsten vorkommende Form der Ozæna als solche bezeichnen, oder sollen wir sie Ozæna simplex oder catarrhalis nennen? Wäre es nicht besser zu sagen: "Catarrhus atrophicus ozænicans"—denn es bleibt uns auch zu discutiren übrig, ob der Gestank bei diesem Leiden ein so wichtiges Symptom ist, um seinetwegen ein besonderes Leiden aufzustellen?

Ich glaube aber, wir thun gut, uns in unserer Discussion lediglich dieser Form der Ozæna zuzuwenden und die anderen in hohem Grade interessanten Fragen zu verfolgen, die sich daran knüpfen. *Woher kommt der Gestank?* Die Antwort lautet: Aus der Zersetzung der Secrete! Aber nicht alle sich zersetzende Secrete der Nase haben den specifischen Nasen-Gestank. Ist es nöthig, dass ein besonderes Ferment hinzu komme? Sind es besondere Formen der Zersetzung, die sich hier finden? Genügt es, dass überhaupt in der Nase Zersetzungen vor sich gehen, um den specifischen Gestank zu erzeugen? Weiter: ist es *immer* eine atrophische Schleimhaut, die diese Form der Ozæna bedingt? Kommt dieselbe auch beim *hypertrophischen* Catarrh vor? Ich glaube, es ist immer eine atrophische Schleimhaut vorhanden, denn ich denke, dass der Verlust der Drüsen erst die Eintrocknung der Secrete ermöglicht. Nasen mit Hypertrophie können auch zuweilen stinken, zeigen aber nicht den specifischen Ozæna-Gestank.

Eine weitere Frage ist die: Ist dieser stinkende atrophische Catarrh immer ein constitutionelles Leiden? Welche Fehler der Constitution bedingen diese? Ich glaube, an und für sich beweist er keine Dyskrasie, und unter den constitutionellen Krankheiten, die hier in Frage kommen, sind diejenigen in den Vordergrund zu stellen, die zum atrophischen Catarrh führen, sicher Scrofulose und vielleicht Syphilis.

Wenden wir uns der Behandlung zu, so wird sich gegenüber dieser Krankheit kein Arzt wie ein Schöpfer vorkommen, der neues Leben schafft! Wie gern würde unser von hohem Mitleid bei diesem ekelhaftem Leiden ergriffenes Herz hülfreich sein—aber es bleibt auch heute noch die Frage bestehen: Können wir diese Ozæna *heilen?* Die Antwort darauf lautet: Die Atrophie sicher nicht, vielleicht aber das lästige Symptom: den Gestank. Um diesen zu entfernen, dazu dienen uns zunächst Douchen, die die stinkenden Secrete herausbefördern. Auch zeigt die Erfahrung, dass die Gottstein'sche Tamponade die Borken auflöst und den Gestank vermindert. Gegen die Eiterung der atrophischen Schleimhaut leisten Adstringentien und die Galvanocaustik die besten Dienste. Meine Herren! Es wäre über Ozæna noch viel zu sagen, ich habe mich aber absichtlich auf die Vorlegung der Fragestellung beschränkt; es bleibt Sache der Discussion das Neue zu Tage zu fördern.

La nature et le traitement de l'ozène.

Dr. E. Fournié, Paris.

Nature de l'ozène.—L'ozène constitue-t-il une maladie distincte? Nous examinerons d'abord si l'ozène constitue par lui-même un état morbide distinct, ou bien s'il est l'expression de plusieurs états morbides différents.

Jusqu'à ces dernières années, les mots "ozène" et "coryza chronique" servaient à désigner la même affection. Encore, en 1869, Desnos, dans un excellent article du "Dictionnaire de médecine et de chirurgie pratiques," accepte cette synonymie, et, si on cherche dans le même ouvrage le mot ozène, on ne trouve qu'un simple renvoi. Pourtant, Trousseau, dans ses cliniques, faisait déjà remarquer que, souvent, l'ozène affecte des allures particulières qui en font une maladie à part: "Lorsque, dit-il, rien ne permet de penser qu'il existe une phlegmasie de la membrane pituitaire, une nécrose des os du nez; quand l'individu atteint de punaisie a les attributs de la plus florissante santé, nous nous voyons forcé d'admettre que, dans ces cas, la sécrétion nasale a une fétidité spéciale, et c'est réellement à cette forme de l'ozène qu'il faudrait conserver l'épithète de punaisie constitutionnelle."*

Cette remarque, pleine de justesse, resta pendant longtemps lettre morte; mais, quelques années plus tard, Warrington Haward ajouta aux trois variétés d'ozène habituellement admises: ozène scrofuleux, syphilitique et traumatique, un quatrième groupe, l'ozène idiopathique.† L'auteur anglais, il est vrai, reste muet sur la pathogénie de cette dernière forme. Il se borne à faire remarquer qu'il a souvent eu l'occasion d'en observer des exemples chez des enfants récemment atteints de rougeole ou de scarlatine, et chez des jeunes femmes mal réglées.

Plus familiarisés avec l'examen rhinoscopique, les médecins durent bientôt reconnaître que l'ozène n'est pas fatalement lié à l'existence d'altérations sérieuses de tissus. Restait alors à en trouver la cause. Quelques-uns s'en

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* Trousseau, "Clinique médicale," 3me édition, t. i. p. 544.
† "St. George's Hospital Reports," vol. viii. 1874-76, p. 123.

tirèrent à bon compte; ils prétendirent que, dans l'ozène, les désordres anatomiques sont constants, mais que les ulcérations, cachées dans la profondeur des cavités nasales, échappent aisément à l'examen. Malheureusement pour la théorie, des autopsies, dont les résultats furent plus tard confirmés par les recherches de Hartmann,* démontrèrent l'absence de lésions nasales spécifiques.

Bien que Trousseau ait écrit que: "on voit fréquemment des personnes dont les narines sont extrêmement étroites de telle sorte que l'air ne passe pas par le nez en quantité suffisante pour les besoins de la respiration, et chez lesquelles, cependant, les sécrétions nasales ne prennent jamais d'odeur;"† bien que pareil fait soit d'observation journalière, certains médecins, à l'exemple de Sauvage, incriminent l'étroitesse des fosses nasales. Dans une note sur le catarrhe chronique, le Dr. Tillot‡ se range à leur avis et pense que "la rétention du mucus au milieu dés cavités nasales rétrécies par la disposition naturelle des os du nez suffit bien seule pour expliquer l'infirmité si fréquente chez les individus ainsi conformés.

Avec Zaufal,§ Michel,‖ Gottstein,¶ la question entre dans une phase nouvelle, et l'ozène idiopathique se substitue dans l'attention des médecins à l'ozène symptomatique. Ce n'est plus l'étroitesse des fosses nasales qu'il faut incriminer, mais bien au contraire leur ampleur. D'après Zaufal, la fétidité trouve sa raison d'être dans une disproportion considérable entre la capacité des fosses nasales et la force du courant d'air expiré. Cet accroissement de capacité est dû au volume rudimentaire du cornet inférieur, lequel joue, à l'état normal, un rôle si important dans le balayage du nez par la colonne d'air de l'expiration. On comprend dès lors que, difficilement entraînées par un courant trop faible, les sécrétions nasales s'accumulent, se dessèchent, et forment des croûtes, qui conservent même après leur expulsion, une odeur repoussante.

Mais la question n'est pas résolue complétement. Cet augmentation de capacité des fosses nasales, cause immédiate de l'ozène, est-elle primitive? N'est-elle point consécutive à une lésion des sinus? Suffit-elle à expliquer l'apparition de l'ozène?

Si l'on en croit Michel, des causes adjuvantes sont nécessaires; il doit y avoir en même temps, du catarrhe chronique des sinus sphenoïdaux et ethmoïdaux.

Quant à Gottstein, il admet que l'ozène n'est que la troisième période d'un catarrhe chronique dont les deux premiers stades sont passés inobservés; la muqueuse, rouge, enflammée, s'est d'abord hypertrophiée, puis à la longue, à l'hypertrophie a succédé l'atrophie. Celle-ci à son tour entraîne l'atrophie des cornets sous-jacents.

Pour Zaufal, au contraire, la déformation du squelette est primitive et congénitale. Cette théorie, soutenue également par Zuckerkandl trouve un appoint considérable dans ce fait que, généralement unilatéral, l'ozène peut être héréditaire; tout comme la déformation nasale qui lui donne naissance. Cette manière de voir a été également soutenue dernièrement dans une thèse remarquable de M. le Dr. Martin.**

Il résulte de l'aperçu historique qui précède, que mieux éclairés, la plupart des médecins reconnaissent aujourd'hui l'existence d'une ozène idiopathique

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* *Deutsch. med. Wochenschrift*, 1878. † "Clin. Méd." t. i.
‡ *Ann. des mal. de l'oreille et du larynx*, t. ii. p. 112.
§ "De l'application du serre-nœud à l'opération des polypes du nez," 1878.
‖ "Maladies du nez et du pharynx." Berlin: 1876.
¶ *Breslau. ärztl. Zeitsch.* ** "De l'ozène vrai:" *Thèse de Paris.* 1881.

constituant par lui-même un état morbide et se distinguant par des caractères particuliers des autres états morbides. Examinons ces caractères.

Caractères distinctifs de l'ozène.—Ces caractères nous les trouvons dans l'odeur, dans l'altération particulière des secrétions de la pituitaire, dans certaines lésions anatomiques, et, par exclusion, dans l'absence de toute autre affection susceptible de se localiser dans les fosses nasales.

A. *Odeur.*—L'odeur de l'ozène vrai est tout à fait caractéristique; mais ce caractère ne peut être bien apprécié que par les médecins qui voient—il serait plus juste de dire qui sentent—beaucoup d'affections nasales; il y a, en effet, dans ce sujet, des nuances, des intensités, des resemblances et des différences qu'on ne saisit bien que par des comparaisons multipliées et après une assez longue pratique. L'odeur de l'ozène vrai ne ressemble ni à l'odeur inflammatoire, ni à l'odeur de la carie, ni à l'odeur de la nécrose, ni à l'odeur de la syphilis, elle est *sui generis*, et, pour la connaître, il faut l'avoir sentie. Elle présente cependant des nuances qu'il n'est pas inutile d'indiquer. Dans les cas peu prononcés elle est moins désagréable et rappelle l'odeur de la marée: c'est cette même odeur attenuée que présentent les malades atteints d'ozène intense après le nettoyage et le lavage des fosses nasales.

D'où provient l'odeur de l'ozène?

Cette odeur ne peut pas provenir d'inflammation, puisque dans l'ozène l'inflammation est beaucoup moins intense que dans certaines maladies u ne donnent d'autre odeur que l'odeur fade de l'état inflammatoire.

Proviendrait-elle de la présence de certaines microbes? Nous n'ignorons pas qu'on a trouvé le bacterium fœtidum de la sueur des pieds mais personnellement nous ne sommes pas fixé sur la légitimité du rôle qu'on a fait jouer à cet élément organique. Cependant, l'occasion était trop belle ici pour ne pas la saisir et nous avons etudié, avec le microscope, les produits de sécrétion de deux malades en traitement. A plusieurs reprises nous avons retiré des mucosités molles ou durcies que nous delayions aussitôt dans un peu d'eau distillée et nous mettions une goutte du mélange sur l'objectif.

Nos examens n'ont abouti qu'à constater la présence de débris de cellules et celle de quelques micrococcus dans lesquels nous n'avons pu reconnaître rien de spécifique.

Ces recherches sont sans doute insuffisantes et nous ne sommes pas autorisé à en tirer une conclusion; mais elles offrent un trop grand intérêt pour que nous ne les reprenions pas dès que l'occasion se présentera. Si on obtenait quelque chose dans cette voie ce serait la justification des idées de Ziem, qui attribue l'ozène à la présence d'un ferment.

Doit-on attribuer le développement de l'odeur à une certaine conformation du nez et des narines favorisant l'accumulation des produits de secrétion et s'accompagnant d'un état inflammatoire plus ou moins intense? Cette manière de voir professée particulièrement par Zaufal est plausible, mais nous ne la partageons pas pour plusieurs raisons.

Premièrement nous avons bien des fois rencontré l'ozène vrai avec une conformation intérieure et extérieure du nez absolument irréprochable. En ce moment même nous soignons une jeune femme qui résume dans ses traits reguliers le type de la jolie femme et qui, néanmoins, est atteinte de l'ozène vrai avec croûtes revêtant la paroi du pharynx nasal.

Secondement, très-nombreux sont les malades qui présentent du coryza chronique avec secrétion abondante et qui n'ont pas d'odeur, bien que leur nez écrasé, la dilatation hypertrophique des narines leur donne les apparences extérieures des individus atteints d'ozène. Nous avons en ce moment même une jeune institutrice de Mannheim, qui présente tout à fait ce type et qui cependant n'exhale aucune odeur.

Disons enfin que s'il était vrai que l'odeur est engendrée par l'altération des mucosités retenues dans le nez, il suffirait d'entretenir la propreté des narines pour empêcher l'odeur de se développer. Or, c'est un fait non douteux, le lavage atténue l'intensité de l'odeur, mais pourquoi? 1°, parce qu'on a fait disparaître un de ses principaux foyers, les croûtes; 2°, parce que les glandules elles-mêmes qui fournissent les mucosités et l'odeur ont participé à ce nettoyage. S'il en était autrement, si l'odeur était due à la cause invoquée plus haut, elle ne devrait se reproduire qu'après un certain temps, c'est-à-dire apres le temps nécessaire à l'altération des mucosités. Or, ce n'est pas ce qui arrive et l'odeur se reproduit aussi intense qu'auparavant quelques heures après le nettoyage, si on n'a employé que de l'eau pure.

Nous ne nions pas cependant l'influence d'une certaine conformation des narines. Nous croyons, par exemple, que la dilatation des cavités nasales favorise le dessèchement des mucosités, mais nous ne saurions admettre que le séjour prolongé de ces dernières dans le nez soit la cause de l'odeur spécifique.

Les auteurs qui soutiennent l'opinion que nous venons de critiquer ont observé un fait relativement vrai, c'est la coïncidence éventuelle d'une certaine conformation du nez et des narines avec l'ozène, mais cette conformation doit être considérée, selon nous, comme conséquence de la cause plus eloignée qui a produit en même temps l'ozène et non comme la cause immédiate de l'ozène. En d'autres termes, certaines conformations vicieuses du squelette indiquent un état constitutionnel qui se manifeste également par de l'ozène.

Voici à présent comment nous comprenons le développement de l'odeur.

Nous considérons l'odeur particulière de l'ozène comme un produit de sécrétion des glandes de la pituitaire. Chaque région du corps, au point de vue qui nous occupe, a une odeur *sui generis* qui s'exhale naturellement ou que l'état morbide met en relief, telles: l'odeur de la respiration buccale et nasale, l'odeur des aisselles, l'odeur de la sueur des pieds, l'odeur de la tête, l'odeur des parties génitales, l'odeur des abcès du périnée ou de l'aisselle, l'odeur de la stomatite mercurielle, &c.

Eh bien, les glandes de la pituitaire sécrètent elles aussi, une odeur particulière et cette odeur, dans certains cas, revêt les caractères spécifiques de l'odeur de l'ozène. Ce qui prouve d'ailleurs qu'il en est ainsi c'est que les produits de secrétion retirés des narines présentent la même odeur. Sur ce point il ne nous semble pas qu'on puisse dire plus.

Il est bien plus utile de chercher comment il se fait que, dans certain cas, l'odeur naturelle de la pituitaire revêt les caractères de l'odeur de l'ozène, car ceci nous place sur le véritable terrain de la nature de la maladie.

Si nous éloignons l'idée de toute cause inflammatoire aiguë ou chronique—car l'expérience de tous les jours prouve que les inflammations les plus intenses peuvent siéger dans les narines sans provoquer de l'odeur; si nous éloignons également les causes spécifiques que peuvent donner lieu à des lésions odorantes—ces dernières se distinguent suffisament de l'odeur de l'ozène vrai—nous restons en présence d'une seule cause possible; l'état constitutionnel de l'individu, état qui provoque dans les acini de la membrane de Schneider une sécretion d'odeur morbide, de la même manière qu'il provoque ailleurs des sécrétions purulentes, des altérations osseuses, &c.

Telle est la manière de voir à laquelle nous a conduit notre expérience personnelle, sur la cause première de l'odeur de l'ozène.

B. *Altérations des sécrétions de la pituitaire.*—Le second caractère de l'ozène que nous ayons à examiner est l'altération particulière des produits de sécrétion de la pituitaire et de la muqueuse pharyngo-nasale. Ce qui frappe tout d'abord dans l'examen de ces produits, c'est la tendance qu'ils ont à se

concréter. Quelle que soit la forme de l'ozène, les produits de sécrétion se concrètent toujours et plus rapidement que dans d'autres états morbides. Cela dit, il nous paraît utile de considérer ici une forme humide et une forme sèche.

Dans la forme humide les mucosités se concrètent en paquets, mais sans se dessécher, elles sont entourées d'une certaine humidité due probablement à la prédominance de l'état catarrhal. On rencontre surtout cette forme chez les natures scrofuleuses.

Dans la forme sèche, les mucosités non seulement se concrètent presqu'immédiatement après leur sortie des glandes, mais encore elles se dessèchent, prennent une teinte noirâtre ou grise et adhèrent fortement à la muqueuse.

Cette forme affecte de préférence le pharynx nasal et la partie postérieure des fosses nasales.

La rapidité de formation de ces produits est telle que du jour au lendemain ils recouvrent de nouveau la surface qu'on avait pris soin de nettoyer. Leur adhérence est telle sur le pharynx nasal que souvent on est obligé de les saisir avec des pinces, et encore ne les enlèvent-on que par morceaux.

Il est évident que ces produits ne ressemblent en rien aux produits de sécrétion qui accompagnent les autres états morbides, et que la rapidité de leur formation éloigne toute idée d'une cause mécanique provenant de la trop grande dilatation des narines. Il y a quelque chose de plus, et ce quelque chose est une altération spécifique des glandes qui fournissent le mucus.

C. *Lésions anatomiques.*—Les lésions anatomiques qui accompagnent l'ozène ne sont nullement en rapport, par leur peu de gravité apparente, avec l'intensité de la maladie ; un peu d'injection de la muqueuse, quelques excoriations sous les croûtes telles sont les seules lésions qu'on rencontre dans un examen superficiel. Cependant, en voyant de plus près les choses, et après un certain temps d'expérience, on arrive à constater des modifications plus sérieuses sur lesquelles Zaufal et Michel ont appelé les premiers l'attention. Nous voulons parler de l'atrophie progressive des parties molles qui recouvrent les cornets et principalement le troisième. Cette atrophie résultant d'un véritable catarrhe atrophique aurait été précédée, selon M. Gottstein, d'un catarrhe hypertrophique et conduirait à la guérison spontanée de l'ozène vrai quand elle a atteint le cornet lui-même.

Quoiqu'il en soit, l'atrophie de la muqueuse et des parties sous-jacentes est un fait généralement vrai, mais surtout dans la forme humide, catarrhale et coïncidant avec le tempérament scrofuleux. Nous ne l'avons jamais rencontrée dans la forme sèche.

Voici d'ailleurs les caractères particuliers de ces deux formes :—

A. *Forme sèche.*—Il y a des personnes qui présentent un ozène très-prononcé sans qu'il y ait catarrhe. Mais si l'on regarde dans les narines ou dans la région pharyngo-nasale on voit la muqueuse recouverte, par places, d'un enduit noirâtre assez adhérent. Cet enduit s'accumule très souvent vers la partie postérieure du plancher des narines et forme là de véritables paquets qui séjournent longtemps si on ne les retire pas.

Au-dessous de cet enduit noirâtre la muqueuse est rouge, saignante excoriée plutôt qu'ulcerée. Nous tenons beaucoup à cette distinction parce que l'on a toujours fait jouer un grand rôle à des ulcérations qui n'existaient pas ou qui ne sont pour rien dans la genèse de l'odeur. Cette forme se rencontre surtout chez les constitutions entachées d'herpétisme.

B. *Forme humide.*—C'est la plus fréquente. La muqueuse qui recouvre les narines est plus ou moins gonflée, tomenteuse, excoriée par places, surtout au niveau des parties resserrées de la cavité nasale et, en ces points, recouverte de petits amas de matière muco-purulente, plus ou moins tachée de noir. Cette

matière se présente en grande quantité sur la partie postérieure du plancher des narines où elles se réunissent en paquets plus ou moins bruns, plus ou moins durs, mais jamais ni aussi noirs ni aussi durs que dans la forme sèche. Un point qui m'a paru être un siége de prédilection des manifestations morbides est le pourtour de l'orifice postérieur des narines formé par le bord postérieur du vomer, les palatins et le sphenoïde. C'est là surtout que l'on voit de petits amas, comme des grains de millet, formés par du muco-pus et une matière brune qui simulent des ulcérations à fond grisâtre. Si on enlève ces amas on trouve à leur niveau la muqueuse gonflée, saignante, mais non ulcérée profondément.

Tels sont les caractères anatomiques que nous avons relevés dans l'ozène.

Il résulte donc de ce qui précède, que l'ozène constitue un état morbide distinct de tout autre et caracterisé par une odeur spécifique, par des produits de sécrétion alterés d'une façon spéciale, et enfin par des lésions anatomiques particulières. Cet état morbide serait, à notre avis, dû à une disposition constitutionelle et non à des causes ambiantes, mécaniques ou autres.

2.—*Traitement de l'ozène.*—S'il est vrai que les médications nous montrent la nature des maladies, *naturam morborum ostendunt curationes*, il n'est pas moins certain que, la nature d'une maladie étant connue, nous sommes en état d'instituer un traitement sinon toujours efficace, du moins très-rationnel.

Partant de cette idée, que l'ozène est un état constitutionnel provoquant des altérations particulières dans la membrane de Schneider, nous sommes conduit : 1° à modifier la constitution ; 2° à réprimer localement les manifestations morbides.

Parmi les modificateurs de la constitution nous donnons la préférence aux bains sulfureux pris par séries de douze chaque fois, trois ou quatre fois l'an, chez ceux qui présentent la forme humide. Nous leur faisons prendre en même temps, soit de l'huile de foie de morue, soit de l'iodure de potassium, soit de l'iodure de fer, selon les besoins du moment.

A ceux qui présentent la forme sèche, nous leur recommandons plutôt les bains alcalins alternés avec les bains arsénicaux, également par séries de douze trois ou quatre fois l'an.

En même temps, nous leur faisons prendre alternativement l'arsénic et le bicarbonate de soude à l'intérieur.

Quant au traitement local, il comprend : (1) les soins de propreté (2) les agents capables de neutraliser l'odeur ; (3) les agents modificateurs des parties malades.

(1) *Soins de propreté.*—Les soins de propreté consistent en lavages répétés deux ou trois fois par jour avec de l'eau tiède additionée de sel marin (une cuillerée à café par litre). Ces lavages peuvent être effectués, soit avec le syphon de Weber, soit avec la seringue anglaise. Cependant, nous devons dire qu'avec ces appareils on s'expose à des inconvénients, qui pour n'être pas fréquents n'en sont pas moins réels. Nous voulons parler de la pénétration éventuelle de l'eau soit dans les trompes, soit dans la bouche.

Le seul moyen de fermer la trompe et en même temps l'orifice bucco-nasal, consiste à contracter les péristaphylins, comme nous l'avons démontré autre part. Mais, comme il n'est pas toujours facile de soumettre ces muscles à la direction de la volonté, nous avons cherché un acte physiologique, compréhensible et facile pour tous, qui nos donnât le résultat désiré. Cet acte consiste à souffler fortement dans un tube, et, pour ne pas perdre cette dépense de travail, nous lui faisons remplir l'office de la poire de caoutchouc que l'on place sur les flacons pour pulvériser de l'eau. L'appareil dont nous nous servons ne pulvérise pas de l'eau, mais il injecte l'eau avec l'énergie que l'on désire dans la

région pharyngo-nasale.* Avec ce appareil on est à l'abri de la pénétration de l'eau dans les trompes et de sont passage dans la bouche.

Les lavages ne suffisent pas toujours à débarraser les narines des mucosités qu'elles contiennent. Il est indispensable alors de les détacher avec une tige terminée par un bout entouré de coton qu'on introduit dans les narines, ou bien, s'il s'agit de la région pharyngo-nasale, avec une tige recourbée et des pinces.

Parmi les moyens de pansement, nous devons signaler particulièrement le coton introduit dans les narines.

M. Zaufal emploie le coton pour remédier à l'élargissement des narines ; M. Gottstein l'emploie dans le but d'exercer une action irritative et sécrétoire. Quant à nous, nous nous en servons avec l'idée de faire du Lister, ou plutôt dans le but que se propose d'atteindre M. Alphonse Guérin (selon les indications de Pasteur) dans le pansement ouaté des plaies. Selon nous, la ouate introduite dans les narines empêche les germes de l'extérieur de pénétrer et d'agir sur les mucosités, qui ont déjà une tendance à se décomposer. Quelle que soit d'ailleurs l'idée théorique qui préside á l'emploi du coton, ce moyen est excellent comme palliatif, et nous ne saurions trop le recommander.

(2) Les agents neutralisateurs de l'odeur sont très-variés depuis le permanganat de potasse jusqu'à l'iodoforme. Nous donnons la préférence à l'acide borique (3 gr. p. 500 gr. d'eau) et au salicylate de soude (10 gr. p. 500 gr. d'eau).

Ces agents doivent être employés à la dose d'une petite seringuée par narine immédiatement après le lavage.

(3) Les agents modificateurs de la muqueuse sont nombreux ; nous employons à cet effet les eaux minérales sulfureuses, alcalines, arsénicales et enfin la solution de nitrate d'argent au cinquième et la teinture d'iode pure ou mélangée par moitié avec de l'acide phénique.

Nous employons les eaux minérales comme eaux de lavage, à la place de l'eau salée quand le malade prend des bains.

Quant aux caustiques, nous les appliquons au moyen d'une tige terminée par du coton tous les deux ou trois jours et en nous servant du *speculum nasi*.

Il nous est impossible, ici, d'entrer dans les détails, mais ces indications générales adressées à des médecins qui sont comme nous au courant de ces questions nous paraissent suffire.

D'ailleurs, les moments de cette lecture sont comptés et nous ne saurions, sans indiscrétion, aller plus loin.

Bornons-nous à dire, en terminant, que grâce surtout aux travaux des médecins spéciaux, qui manient le laryngoscope et le rhinoscope, l'ozène n'est plus, de nos jours, une maladie désespérante et rebelle à nos moyens. Aujourd'hui, le médecin peut toujours pallier convenablement les inconvénients de l'ozéne et bien souvent en triompher.

The Clinical Aspects of Chronic Discharges from the Nostrils and Ozæna.

Mr. Spencer Watson, London.

I recognize three typical forms of chronic rhinorrhœa, the outcome of which in the later stages may be ozæna: 1. The eczematous or scrofulous form, beginning in infancy or early childhood, and being then associated with

* M. Roustan, de Montpellier, a eu une idée analogue pour l'insufflation de la trompe ; mais le principe est différent.

the characteristic physiognomy of scrofula. 2. The phthisical or lupoid form, beginning generally in youth or early adult life, in individuals of a family other members of which are phthisical or ozænic; the physiognomy being in these cases such as is often associated with phthisis, and the face being sometimes scarred by lupoid ulcers or the traces of lupus erythematosus. 3. The syphilitic form. The hereditary syphilitic physiognomy in youth and adult life, and especially the sunken bridge of the nose and the Hutchinsonian upper incisor teeth will enable us to recognize this form. It begins in very early infancy. It is not necessarily or commonly associated with diseased bone. It is often aggravated by nasal stenosis. The syphilitic ozæna of acquired syphilis, on the other hand, is often asociated with diseased bone, and is recognized rather by the character of the ulceration and the personal history than by physiognomical peculiarities.

There are besides these three typical forms of rhinorrhœa mixed and intermediate forms, but it is generally possible to classify cases of ozæna under one or other of these heads. The ozæna described by some authors (*e.g.*, Trousseau) as constitutional, and by others as ozæna by exhalation (*e.g.*, Cozzolino of Naples), may perhaps be only cases of lupoid origin in which the external manifestations are very slightly pronounced.

In making a diagnosis of these various forms we have to consider: 1. The age. 2. Physiognomy. 3. Family history. 4. Rhinoscopic inspection. 5. Results of treatment. In regard to rhinoscopic inspection I will only say that the presence or absence of ulceration will often determine the question as to acquired syphilis being the cause; and that anterior rhinoscopy gives often more information than posterior. I gave a description of my method of anterior rhinoscopy in No. 1 of the *Specialist*, September 1, 1880, illustrated by woodcuts. In fig 4, on page 5 of that number, the patient is represented as spreading out and drawing down the upper lip, while the hooks of the dilator draw the ala outward and the tip of the nose upward. In fig. 5 another method is shown; it is somewhat simpler, and answers better in some cases.

Treatment.—In no single case of ozæna can an unvarying line of treatment be adopted throughout the case. The ozæna of to-day is an entirely different thing from that of yesterday, and to-morrow will bring about another phase of the disease.

Many of our failures have probably been due to our not recognizing this extremely perplexing feature of ozæna, and to our too obstinate persistence in some favourite method of attack, and too little regard for the protean and treacherous character of the foe. To-day perhaps the nostrils are completely blocked by dry greenish crusts, yesterday they were discharging pus, to-morrow they may be ulcerated and with a flow of sanious matter; we ought to be prepared with corresponding changes in the local applications. It will be convenient to consider the treatment under two heads.

1.—Methods of treatment for the removal of sequestra or foreign bodies. I believe the best method is through the natural passages, the only operative proceeding that is necessary being a forcible expansion of the walls, especially of the septum, by means of a strong pair of forceps. The deeper-seated region can then be reached, and the sequestrum, if any, removed by means of the canula or other suitable forceps. If the passage is very narrow, and the sequestrum small, the canula forceps offers many advantages from the circumstance that it can be passed through a very small passage, and when opened occupies a very small space. Rouge's operation is a better method in a few exceptional cases—viz., those in the vestibular position of the meatus rhinarius are separated from the deeper region by a narrow internal meatus formed of a ring of thickened mucous membrane, which thus diminishes

the available space at the junction of the cartilaginous and bony portions of the alæ and septum. In ordinary cases the difficulty of exploring and passing instruments into the deeper parts depends upon the rigid bony constriction of the channel at this point. Rouge's operation merely displaces the vestibular portion of the meatus—the deeper bony constriction being unaffected by it—and hence it is only when the soft parts are abnormally thickened, congenitally or by disease, that the aperture of the internal meatus is practically widened by Rouge's operation. The depth from the surface is no doubt lessened, but this trifling advantage is counterbalanced by the not infrequent hæmorrhage, a complication which is very embarrassing.

2.—As methods of local cleansing and deodorization, I can strongly recommend the use of sulpho-carbolates in the form of douche or spray, and, in very obstinate cases, of sulphurous acid solution, beginning with a weak solution and gradually increasing its strength. Weber's douche (not the syphon form) should be used as a preliminary to other treatment; but when the crusts are very large and obstruct the nostril, the douche is essential and must often be repeated. Rumbold's nasal catheter is also useful. Iodoform is very useful in the form of pencils made up with cocoa butter. These pencils can be thrust very high up by the patient himself, and melt at the temperature of the nostrils, leaving the iodoform to exert its specific action *in situ*, and at the same time lubricating the membrane around. I rarely use strong caustics in any case of chronic discharge from the nostrils, the difficulty of ascertaining where they are to be applied being an insuperable objection. The sulpho-carbolates diluted with sugar and bismuth may be used as snuffs, and their application is much facilitated by the use of the insufflator (here shown). Chronic serous and sero-purulent discharges from one nostril have sometimes been traced to disease in the antrum. A notable instance was recently brought forward by the President of this Congress, in which after death mucous cysts were found in the antrum. In these cases, the only indication of the seat of the disease is that afforded by the circumstance that the flow is increased in quantity when the head is turned to the side opposite to that of the nostril affected. The absence of pus from the discharge and the chronic nature are confirmatory of the diagnosis of antral disease. These are very rare cases, but others occur in which the sero-purulent discharge is so copious and lasts so long that there seems to be a general catarrh of the whole lining membrane of the nasal passage, including that of the antrum. I once succeeded in checking such a catarrh from one nostril which had been going on for several years by the use of copaiba and the mineral acids given internally and applying solution of nitrate of silver to the nostril. These cases are so rare that a success of the kind is perhaps worth recording, the use of copaiba for catarrh of the air passages being, I believe, not very often resorted to.

DISCUSSION.

Dr. Krause, Berlin: I desire to communicate the results of two post-mortem examinations of pure ozæna, or, as Zuckerkandl has called it, "genuine atrophy of the turbinated bones," which Prosector Dr. Chiari, of Vienna, has placed at my disposal, and which I examined. They will, I trust, contribute towards clearing up the question of the origin of the fœtor in this disease; for it is undeniable that the whole ozæna question turns, in the first instance, upon this hitherto undecided, and yet so important, point, about which we see such a divergence of opinion. Ziem states that ozæna can be produced by carious teeth, and is transferable by pocket-handkerchiefs; according to Michel, the fœtor originates in the cavities adjacent to the nose; Fournié seeks the cause in a specific quality of the glands of the nasal mucous membrane; and

B. Fränkel, to whose observations and conclusions I come nearest, believes that the cause must be sought in a chemical process of disintegration (ferment), which I, however, in opposition to him, cannot look upon as being transferable and coming from without. My two cases were observed during life by Professor von Schrötter and Primararzt Dr. Mader, in the Rudolf Hospital at Vienna. Neither during life nor at the post-mortem were ulcers of the mucous membrane or carious or necrotic processes on the bone found. The histological examination in both cases was made in such a manner that the mucous membrane of one half of each nose was examined throughout, the sections being made close to another; from the other halves some specimens were removed for the purpose of checking the results thus obtained. The results, which the members present are requested to check by reference to the microscopical specimens in the next room, were briefly and generally as follows: the epithelium frequently defective, sometimes entirely absent in several places, had undergone a horny change. The mucous membrane itself shows marked atrophy. Everywhere are seen large tracts of a dense connective tissue, which only become thinner and more delicate superficially, but which even there are present almost everywhere. As to the blood-vessels, there is a marked loss of them generally, and those remaining have undergone considerable changes; the adventitia is thickened, the intima tortuous, the lumen conspicuously narrowed. The glands are comparatively well preserved in a few places only; most of them show a much-developed infiltration, others a granular or fatty degeneration; again, large tracts of the mucosa are traversed without detecting a trace of them. The most remarkable thing, however, in our specimens, is the presence of an enormous infiltration of round and spindle cells, the cells of which do not show anywhere a distinct contour, but have disintegrated into a fatty detritus, which is often still arranged in the former cell form, and besides this infiltration the presence in the mucous membrane of numerous large and small fat globules, a fact which is very suggestive of an explanation of the origin of the fœtor. To this I shall return presently. Now I wish to say that analogous processes in the mucous membrane are found in xerosis of the conjunctiva, and in the callous stricture of the urethra.* If we now pass to the question whether and how the described changes can explain the characteristic symptom of ozæna—viz., the fœtor, I am well aware that I cannot draw positive conclusions from the results of two post-mortem examinations. On the other hand, however, the absolute identity of both cases, and the facility with which the mode of origin of the fœtor can be explained by the changes described, admits of a great amount of probability for my conclusion—viz., that we have to seek in this enormous fatty detritus, and in the numerous fat globules, the factor which produces the fœtor. We find horny epithelium, which appears to be a very suitable soil for the formation of crusts and scabs; we find a considerable loss of blood-vessels in general, and changes in the individual ones; we find further destruction of the glandular elements which has nearly led to their total abolition; finally, we see the fatty detritus and the fat globules. Mucous membranes of this atrophic character can only produce a very tenacious, quickly-drying secretion, which will form scabs and crusts with the horny epithelium. The enormous quantity of fat secreted into and beneath the epithelium will quickly undergo disintegration and change into fatty acids in the crusts, and will thus produce the sickening and rancid smell, the occurrence of which cannot under these circumstances be strange. The corroboration that this effect is due to the fat we find further in the result of the microscopic examination

* See Graefe and Saemisch, *Handbuch der Gesammten Augenheilkunde*, 1874; and Dittel, in Billroth-Pitha's Handbuch, *Stricturen der Harnröhre*, 1860.

of the crusts in our two cases, which showed fatty degeneration of epithelium, accumulations of fat granules, fat globules, and numerous crystals of margaric acid; and in the opinion of Arnold Hiller, on the fatty acids proper, in his "Lehre von der Fäulniss," p. 75.

Dr. E. Fränkel, Hamburg: I do not think that Dr. Krause has established his point—viz., that the origin of the fœtor is due to the fat, for in my own case of true ozæna (described in vol. lv. of *Virchow's Archiv*), which is the first ever giving the results of a post-mortem in this disease, as well as in two other unpublished cases of mine of true ozæna, this condition was absent, and yet the fœtor was present. Also the similarity of the microscopic phenomena of true ozæna to the changes in xerosis conjunctivæ does not prove anything, because the crusts of xerosis do not stink. I urgently desire to plead for the abolition of the expression, "ozæna," which indicates only a symptom, and says absolutely nothing as to the diagnosis.

Dr. Kendal Franks, Dublin: The different views which are held as to the cause of true ozæna make it important to detail individual experiences. I have met with several cases of true ozæna where there was no previous history of catarrh, no disease of the deeper structures in the nose, no ulceration of the mucous membrane, and where there was no dyscrasia whatsoever, neither in the patients themselves nor in the members of their families. These cases are explicable only on the theory which Zaufal has propounded. They all showed a remarkable absence of the turbinated bones. On examination, the interior of the nose showed large caverns, through which the posterior wall of the naso-pharynx, the openings of the Eustachian tubes, and the action of the palati muscles could easily be seen by anterior rhinoscopy. The mucous membrane was atrophied and dry, and covered with dry crusts of inspissated mucus. Amongst the cases illustrative of this condition which I have seen, one especially was remarkable, in which one side of the nose was thus formed, but the other normal. In this case there was no fœtor, which is to be explained by the expiratory force being sufficient to clear the nostril, as one side was normally formed. The patient used constant efforts to keep it clear.

Dr. Hopmann, Cologne: I wish urgently to recommend the use of Gottstein's tampon, especially in those forms in which no severe dyscrasia is or has been present. In these cases tamponade does everything one can wish of a palliative remedy in a disease which, strictly speaking, is still incurable. Of 100 cases of ozæna which I have seen during the past five years, and which have given me the material for the above statement, 54 were cases of average or greater severity, 16 of these occurring in men, 38 in women. These cases which remain after the deduction of the cases of recent and past syphilis, of undoubted scrofulosis, of phthisis, of foreign bodies, of caries, of hypertrophies, of formation of crusts, with simultaneous existence of marked atrophy of the turbinated bones without or with very little fœtor, are distinguished by atrophy of the middle or lower turbinated bone, or of both; by the formation of very fœtid crusts; by anosmia or diminution of smelling power. These cases are possibly produced by arrested development of the bony framework of the nose, especially of the conchæ, during the second period of dentition, and some of them perhaps also during the period of puberty, although the general explanation at the present time is that the atrophy, even of the bones, is the final result of a primary hypertrophic, later on atrophic, morbid process of the mucous membrane. If the development of the bony framework is arrested, it is evident that the development of the mucous membrane covering it will also

suffer in the end. Although Gottstein's tamponade is useful in almost all forms of ozæna, it is, according to my own experience, especially so in the last-named class of cases, in which it does most excellent service in successfully counteracting the formation of crusts and the fœtor. At the same time, it is perfectly harmless and convenient, provided that no fault is made in its employment.

Dr. BAYER, Brussels: According to my experience the atrophic state of the mucous membrane is but the ultimate result, whilst the first period is characterized by hypertrophy of the mucosa. I have observed in one and the same family several members suffering from ozæna. The youngest of them showed a hypertrophic state, whilst in the older ones atrophy was present; in some both conditions existed simultaneously. As regards the narrowness being the alleged cause of ozæna, I, in common with other observers, have noted that often in persons who have one large and one small nostril, ozæna is present in the large one, whilst it is absent or but little developed in the small one. It is very difficult to say at what point ozæna proper commences, on account of the varying smelling power of observers. An acute inflammation or catarrh can become the direct cause in a predisposed person. Very frequently ozæna is allied to a general dyscrasia, such as eczema or the herpetic diathesis of the French. In these cases general treatment is absolutely necessary to obtain radical cure. Carbolic acid is not to be recommended locally, because it often completely destroys the power of smelling in those cases in which it had been preserved. The galvano-cautery and the local application of iodine might destroy glands which have still remained intact.

Dr. MICHEL, Cologne: I think that the nature of ozæna can only be ascertained by numerous post-mortem examinations. The autopsies made by Zuckerkandl and by E. Fränkel speak in many respects for my own views. Krause's results are not quite convincing, as they concern older individuals in whom the malady was already of a retrogressive character. I myself look upon ozæna as a constitutional disease. No one who is quite healthy gets ozæna. As regards treatment I am as satisfied with my method as others are with the tamponade. My method consists in instructing the patient to syringe, during the first two months, the nose, three times daily each time with two to three pints of cool water. I use either plain water or a weak solution of soap and water, or of chlorate of potash, and neither make cauterization nor pulverization. After this period it is sufficient to syringe twice a day; later on even only once a day. The patients are quite free of all complaint under this treatment. I have examined patients who have treated themselves in this manner for periods of five to eight years. As soon as they omit to syringe for eight to fourteen days the yellowish fœtid secretion returns. I would fain request the gentlemen present to syringe themselves once the nose of a patient suffering from ozæna, whose nostrils are filled with stinking crusts, to convince themselves that the cleansing is complete, and to examine the patient again on the next or on the second day. They will then convince themselves that the greater part of the secretion is to be found in the posterior part of the nose—*i.e.*, where the evacuation of the sphenoidal and ethmoidal cavities takes place. It will be seen that crusts, bridge-like, join the middle and lower turbinated bone, or, in a transverse direction, the middle turbinated bone and the septum; or that a thick yellow mucous tract hangs down from the middle turbinated on to the lower or into the floor of the nose. The mucous membrane itself will be found fresh, red, smooth, and shining.

Dr. GOTTSTEIN, Breslau: Dr. Krause's observations as to the origin of the

fœtor do not agree with the microscopic investigations of Dr. E. Fränkel and my own. Nor can I agree with the explanation given by Dr. B. Fränkel, inasmuch as there is very frequently in nasal disease stagnation of the pus without fœtor, whilst in the atrophic form the fœtor appears very early, often after a few hours. To Dr. Krause's explanation the success of the tamponade is, moreover, opposed; which therapeutical method I urgently wish to recommend, it having the great advantage that the very formation of the crusts is thereby prevented, whilst irrigation only removes the stinking crusts. I can conscientiously recommend it not only for the atrophic, but for all forms in which formation of crusts occurs. The observation of Michel—viz., that the secretions collect mainly in the posterior part of the nasal cavity—is not borne out by my own observations. It is quite correct that shortly after the removal of the secretion the mucous membrane appears red; in the course of one hour later, however, it appears markedly pale and dotted over with whitish punctiform drops of secretion, so that it appears as if it were covered with flour dust.

Professor Jurasz, Heidelberg: I desire to make some remarks on the atrophic form of ozæna. It is generally taken as granted that this is the final stage of the hypertrophic form; that it consists in a degeneration of the mucous membrane into connective tissue, and in atrophy of the epithelium, and that it is, consequently, very difficult to cure, or rather incurable. I cannot agree to this view for the following reasons: In the first place, it seems to me somewhat bold to draw from the few microscopic examinations the conclusion that in all cases of atrophy of the mucous membrane there must also be a degeneration of the same. Further, the so-called "rhinitis atrophica fœtida" sometimes develops without a previous hypertrophy. Finally, the treatment does not present so little chance of success that this form is to be looked upon as incurable. Already Weber-Liel has stated that he has observed cures, and I have seen within the last few years two cases in which ten months and four months respectively after dismissal from treatment no relapse had occurred. I use, besides nasal douches, cotton-wool tampons, impregnated with a one to two per cent. carbolic acid solution. If it is necessary to irritate the atrophic mucous membrane more powerfully than can be done by means of the cotton tampon, I make local applications of irritant fluids (tinctura aromatica, salicylic acid, and veratria). From the fact that in this manner success is sometimes obtained, I consider myself justified in concluding that in these successful cases no degeneration of the mucous membrane, but other processes—*e.g.*, simple atrophy, or (as already suggested by Weber-Liel) secretory and trophic neuroses may exist. In conclusion, I especially wish to state that in this form I have never observed a good effect from caustics or astringents.

Dr. Löwenberg, Paris: It seems to me that Dr. Krause's granulations are not fat, but micrococci, the distinction between which is often impossible. Besides, his results would not be characteristic of ozæna, for the pus in common otorrhœa without smell contains fat and crystals of margaric acid. Furthermore, fat becomes decomposed, and fatty acids are formed without the characteristic smell of ozæna. Again, Dr. E. Fränkel's results speak against Dr. Krause's conclusions. The efficacy of Dr. Gottstein's tampon is a further proof that this acts as an antiseptic, as formerly shown by Dusch and Pasteur.

Dr. Prosser James, London: I do not consider the results of this discussion, either from an etiological or from a therapeutical point of view, very satisfactory. For my own part I still adhere to the views which I laid down in a paper read before the Medical Society of London in 1871. The only

modification which has taken place in them is in the direction of extension, but not in that of change. I wish to urge the necessity of very frequently repeated examinations, as it is surprising how often with patient examination local lesions will be discovered which at first have been overlooked. The effects of iodoform, which I long ago recommended, of salicylic and boracic acid, and of their derivatives, are often remarkable in the treatment of this affection, but my reliance is chiefly on instrumental medication and exploration.

Dr. B. FRÄNKEL, Berlin: The diagnosis in well-marked cases is easy. The great width of the nostril is the consequence, not the cause, of ozæna. The retention of the secretion alone is not sufficient to produce ozæna; whether a ferment is necessary for this purpose or not I will leave undecided. The objections raised by Professor Jurasz against the connection of ozæna and rhinitis atrophica which I have first established are not conclusive. The specific smell cannot be explained by a specificity of the nasal cavity, for all crusts in the nose are not fœtid; and again the same fœtor is found in certain cases in the trachea in which there is no complication with nasal disease. Fat is a constant product of the disintegration of albumen. A cured ozæna is unknown to me.

A Case of Web in the Larynx, probably Congenital.

Dr. G. VIVIAN POORE, London.

I have ventured to bring a case before the Laryngological Subsection, because I believe it to be of sufficient rarity to interest the members.

The following is a short description of the case:—

Girl, aged 13, healthy-looking, well-grown. Voice, falsetto of peculiar tone, but not hoarse. Has been liable to attacks of difficulty of breathing when she caught cold; was in the Children's Hospital in 1874 for croup. Thorax well formed, nothing abnormal anywhere.

Laryngoscopically.—Web uniting anterior thirds of vocal cords perfectly symmetrical, smooth, apparently covered by healthy mucous membrane and with the posterior border concave; consistence of the web everywhere uniform; its appearance did not suggest an inflammatory origin. During phonation the web became wrinkled, the glottic chink was of very much smaller size than usual, circular in form, and when dilated to its utmost about big enough to admit the tip of the little finger.*

I formed the opinion that the web was congenital—(1) because the patient's voice had always been peculiar since her first cry; (2) because from her earliest infancy she has been liable to attacks of dyspnœa; (3) from the appearance of the web, which had nothing about it to suggest inflammatory, or other pathologic origin. Two questions occurred to me. How were such webs caused? Certainly either by the occurrence of disease or inflammation *in utero;* by the arrest of development; or the survival of some fœtal condition. Normally, I believe, there never is a web in the larynx at any period of the development of the fœtus, so that the last theory is untenable.

How common are such webs? Are they even the unsuspected cause of "still-birth," of faulty expansion of the lungs, or of the patency of fœtal vessels giving rise to cyanosis?

My patient is in perfect health; her lungs are well developed; she is

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* The patient was shown at the first clinical demonstration.

not cyanotic, and the only inconvenience she suffers is the peculiarity of her voice.

Under these circumstances I do not think it advisable to attempt any operative interference. I would at least delay such interference until the child had completed her development into womanhood.

DISCUSSION.

Dr. Solis Cohen, Philadelphia: I have to relate a case of web of the larynx, the evident result of the agglutination of eroded papillary excrescences, for the dyspnœa from which tracheotomy had had to be performed a few years previously. I doubt whether there is sufficient evidence that these cases are congenital malformations; and I believe that the web may be the result of irritative agglutination in infantile or even fœtal life, in the same manner as in the case I have narrated.

Dr. Böcker, Berlin: A woman, aged 30, whose case I have described in the *Deutsche Med. Wochenschrift* (No. 32, 1875), suffered from a membranous web just beneath the vocal cords, which had originated without any previous inflammatory symptoms or any laryngeal disease. After repeated incisions, the loosened membrane was removed by means of the forceps, and a complete and permanent cure was effected.

Prof. Schnitzler, Vienna: I think that membranous adhesions of the vocal cords are not so very rare. I have observed several such cases, some congenital, some produced by inflammatory processes. The best method of treatment is the galvano-caustic, though the membrane may also be cut by a simple knife. Catheterism of the larynx is the best means of preventing re-adhesion.

The Spray Producer; the best Means of Making Applications to the Superior Portion of the Respiratory Tracts.

Dr. M. F. Rumbold, St. Louis, U.S.A.

The author insisted upon the importance of removing morbid secretions from, and applying remedies to, every portion of the irregular surface, without causing the least irritation. He gave arguments to show that the probang, brush, &c., now in use do not fulfil these indications, whereas the spray was at the same time very mild and thorough in its action and penetrated to the most concealed part of the diseased surface. He described the different forms of the spray-producer he employed.

Ueber die physiologische und pathologische Schleimabsonderung im Kehlkopf und der Luftröhre, sowie Beiträge zur Wirkung expectorirender und adstringirender bei Schleimhaut-Katarrhen angewendeter Arzneimittel.

Professor Rossbach, Würzburg.

1) Die Secretion des Schleimes ist eine continuirliche. Wenn man den Kehlkopf und die Trachea stundenlang, sei es laryngoscopisch, sei es direct bei blosgelegter Kehlkopf- und Trachealschleimhaut beobachtet, so findet man

letztere immer bedeckt mit einer dünnen, wasserklaren, aber ziemlich zähen Schleimschicht. So oft man auch durch festes Aufdrücken von gutem Fliesspapier die Schleimhaut trocken zu legen versucht, immerund immer wieder sieht man unmittelbar nach dieser Procedur den Schleim in kleinen Tröpfchen aus allen Schleimdrüsen hervorquellen, nach einer bis zwei Minuten durch fortwährende Vermehrung zusammenfliessen, und die ganze Schleimhaut von Neuem mit einer zusammenhängenden Schleimschicht überziehen. Auch wenn man unmittelbar nach dem Abtrocknen die Schleimhaut mit einer feinen, reinen Oelschicht überzieht, tritt in ganz gleicher Weise, wie bei der trocken freiliegenden Schleimhaut, die Schleimsecretion sogleich wieder ein.

2) Die secretorischen Nerven der Kehlkopf- und Luftröhrenschleimdrüsen sind bis jetzt noch nicht bekannt; aber jedenfalls können sie nur auf drei Wegen zu den Drüsen gelangen, entweder mit dem Nervus laryngeus superior, oder mit dem Nervus laryngeus inferior, oder mit den feinen Aestchen, die von den Bronchealästen des Nervus vagus aus der Trachea herauflaufen. Ferner können die in diesen drei Nerven in die oberen Luftwege eindringenden Nerven nur herstammen entweder aus dem Hals-Sympathicus, oder aus dem Hals- und Brusttheile des Vagus. Um darüber Aufschluss zu erlangen, wurden alle diese Nerven, zunächst der Hals-Sympathicus, dann der Vagus an verschiedenen Stellen, ferner die einzelnen Nervi laryngei sup. und infer. durchschnitten und ihre peripheren Enden zuerst schwach und allmählig immer stärker faradisch gereizt. Die eintretende stärkere Schleimsecretion auf der gereizten Seite sollte die Wege der secretorischen Fasern kennen lehren, und die Fingerzeige für weitere Untersuchungen abgeben. Allein alle mit grösster Sorgfalt angestellten Reizversuche hatten das übereinstimmende und gleiche Ergebniss, dass durch Reizung weder des Sympathicus und Vagus, noch des Nervus laryngeus superior und inferior irgend eine dem beobachtenden Auge deutlich sichtbare Vermehrung der Schleimsecretion auftrat.

3) Durchschneidung dieser Nerven einzeln oder auf einer oder beiden Seiten zusammen zeigte in den nächsten Stunden und nach mehreren Tagen, wenn die Thiere die Operation überlebt hatten, *a*) dass die Schleimsecretion nach wie vor ihren ungehinderten Fortgang nahm, und nach jedesmaliger Abtrocknung der Schleimhaut sich mit nicht geringerer Schnelligkeit wieder einstellte, wie bei unverletzten Nerven; *b*) dass bei einseitiger Nervendurchschneidung die Trachealschleimhaut auf der operirten Seite stärker injicirt ist und grössere Schleimmengen secernirt, als die Schleimhaut auf der intacten Seite; *c*) auch wenn alle obengenannten Nerven durchschnitten, und ein zwei bis drei Centimeter langes Stück der Luftröhre durch festes Umschnüren aus allen Verbindungen mit Oben und Unten losgelöst war, und dieses Stück sein Blut nur mehr noch von hinten vom Oesophagus her erlangen konnte, dauerte auch in dem abgeschnürten Trachealstücke die Schleimsecretion nach wie vor ohne alle Verminderung und in alter Intensität fort.

Aus diesen Versuchen glauben wir vorläufig schliessen zu dürfen:

Dass von den Nervencentren entweder gar keine oder nur höchst minimale secretorische Reize zu den Schleimdrüsen des Kehlkopfes und der Luftröhre gelangen;

Dass dagegen der Blutreichthum der Schleimhaut in innigem Connex mit der Stärke der Schleimsecretion steht; endlich:

Dass die Schleimsecretion in den genannten Theilen jedenfalls auch nach vollständiger Ausschliessung aller etwaigen von aussen kommenden nervösen Einflüsse ungestört weiter fortgehen kann, dass also entweder periphere, in der Schleimhaut selbst gelegene, die Secretion anregende Nervencentralstellen angenommen werden müssen, und der Schleimhaut der Luftwege in gewisser Beziehung eine ähnliche selbständige Stellung zuerkannt werden muss, wie dem

Herzen, Darm, Uterus u. s. w., oder aber, dass die acinösen Schleimdrüsen der ersten Luftwege überhaupt ohne nervöse Beeinflussung secretorisch thätig sein können.

Wenn man auf den Bauch einer aufgebundenen Katze zuerst fünf bis zehn Minuten lang feuchtheisse, sodann Eisumschläge macht, so tritt eine halbe Minute nach dem Auflegen des Eises ein ausserordentlich starker Gefässkrampf in der Schleimhaut der Trachea und des Kehlkopfes ein; dieselbe wird todtenblass und völlig weiss. Dieser Gefässkrampf dauert eine bis zwei Minuten und fängt dann an einer allmähligen Gefässerschlaffung Platz zu machen. Die Schleimhaut beginnt zuerst ihre normale Färbung anzunehmen, sodann wird sie rosenroth, und zeigt namentlich über den Trachealknorpeln eine bereits abnorm starke Injection. Bald darauf wird die gesammte Schleimhaut blut-, und in fünf bis zehn Minuten schliesslich blauroth. Jetzt sind alle Gefässe auf das Aeusserste erweitert; dabei deutet die blaurothe Färbung darauf hin, dass die Circulationsschnelligkeit in den erweiterten Gefässen nicht zu-, sondern abgenommen haben muss.

Während des offenbar reflectorischen Gefässkrampfes bemerkt man eine Abnahme, im Stadium der Gefässerschlaffung dagegen eine starke Zunahme der Schleimsecretion, so dass im eigentlichen Sinne des Wortes der massenhaft secernirte, aber immer noch wasserklare Schleim förmlich herabfliesst, also eine wirkliche Catarrhoe eintritt.

Macht man nun wieder einen recht warmen Umschlag über den Bauch, dann nimmt die blaurothe Farbe der Luftröhren- und Kehlkopfschleimhaut sogleich, fast momentan wieder ab und weicht einer rothen Farbe; jedoch bleibt die Injection immerhin viel stärker, als im ursprünglich normalen Zustande.

Eine nochmalige Eisapplication bringt sodann ebenfalls wieder ein Erblassen der Schleimhäute zu Stande, aber nur in bei Weitem geringeren Grade und viel später, als das erste Mal.

Es folgt aus diesen Versuchen, dass Verminderung und Vermehrung des Blutzuflusses zur Schleimhaut eine gleichsinnige Beeinflussung der Schleimsecretion zu Stande bringt, dass also zwischen Blutdurchströmung und Schleimsecretion ein inniger Zusammenhang existirt; ferner, dass der Einfluss der Erkältung, bezw. der Application der Kälte auf die vorher stark erwärmten Bauchdecken auf die Schleimhaut der Luftwege doch nicht so insensibel ist, und nicht erst nach Tagen auftritt, sondern dass die Erkältungsveränderungen sogar sehr grober Natur und auf dem Wege des Gefässreflexes unmittelbar eintretende sind.

Beträchtlich und in scharf nachweisbarem Grade gesteigert wird die Schleimabsonderung durch die innerliche Verabreichung von Apomorphin, Emetin und Pilocarpin; am stärksten durch Pilocarpin, auf welches nicht bloss in der Trachea, sondern auch in den Bronchialverzweigungen eine so massenhafte Production höchst dünnflüssigen, wasserklaren Speichels auftritt, dass die Thiere auf dem ganzen Thorax massenhafte Rasselgeräusche hören lassen, und der Schleim, wie bei Oedem, selbst die grossen Bronchien füllt, ja während des Lebens bis in die Trachea massenhaft heraufquillt. Damit nicht der ebenfalls stark vermehrte Speichel etwa in den Kehlkopf gelangen könne, und dadurch Anlass zu Täuschungen gebe, war der Kehlkopf vorher durch einen eingepressten Schwamm verstopft worden.

Die Gefässfüllung der stark secernirenden Schleimhäute zeigte keinen Unterschied gegen die vorausgegangene normale; dagegen vergrösserten sich die Schleimdrüsen so, dass sie als kleine Knötchen über die glatte Oberfläche der Schleimhaut hervorragten. Dass die Mittel nicht auf indirectem Wege durch Beeinflussung der Drüsen und Drüsennerven ihre Wirkung auf die

Schleimabsonderung entfalten, ergab sich aus dem Verhalten nach Unterbindung aller bedeutenderen, die Trachea versorgenden Gefässe, der beiderseitigen grösseren Carotidenäste und des Truncus thyreo-cervicalis. Die Pilocarpin-injection bewirkte, trotz der abgesperrten Blutzufuhr, dennoch eine reichlichere Schleimabsonderung.

Gänzlich aufgehoben wird die Schleimsecretion durch Atropin so, dass die vorher stark feuchtschleimige Schleimhaut absolut trocken wird; trotzdem, dass in Folge dieser Trockenheit, vielleicht auch durch die Wirkung des Atropins, die Schleimhaut im Laufe der Beobachtung immer hyperämischer wurde, blieb die Schleimabsonderung länger wie eine halbe Stunde aus, ein Beweis, dass Atropin nicht in Folge von Circulationsstörungen, sondern direct Drüsen und Drüsennerven beeinflusst.

In zweifacher Weise, je nach der Anwendungsart, wirken Alcalien, wenigstens das von Rossbach und Aschenbrandt angewandte kohlensaure Natrium und der Salmiak. Spritzt man von dem ersteren 2·0 Gramm, von dem letzteren 1·0 Gramm direct in das Blut (in eine Beinvene), so nimmt in kürzester Zeit die Schleimsecretion der Trachea bedeutend ab, ja hört in einzelnen Fällen ganz auf; dabei wird die Schleimhaut blutleerer.

Bringt man dagegen die Alcalien in wässeriger Lösung direct durch Aufträuflung auf die Schleimhaut selbst, so wird die Schleimhaut geröthetet, und die Schleimsecretion nimmt zu. Am intensivsten zeigt sich dies bei Anwendung selbst sehr starker Verdünnungen von Liquor Ammonii caustici, nach welcher eine sehr hochgradige Hyperämie und Ausdehnung der kleinsten Gefässe und massenhafte Schleimsecretion eintritt. Dass durch stärkere Concentrationen im Verlauf eines Tages schliesslich Croupmembranen auf der Schleimhaut sich bilden, können auch sie bestätigen.

Oleum Terebinthinae rectif. zeigte, je nachdem es in wässeriger Lösung oder einfach mit Luft in kleinen Mengen gemischt angewandt wurde, ein verschiedenes Verhalten. Wenn man auf eine bestimmte Schleimhautstelle Luft mittelst einer einfachen Vorrichtung aufblasen liess, die vorher durch ein Glas mit Terpentinöl geleitet worden war, und demnach sich mit Terpentindämpfen möglich vollgeladen hatte, so nahm die Schleimsecretion immer mehr ab, hörte schliesslich ganz auf, und die Schleimhaut wurde an der betreffenden Stelle ganz trocken; sobald man mit diesen Anblasungen aufhörte, begann die Schleimsecretion sogleich wieder. Controlversuche mit Anblasung gewöhnlicher Luft in gleicher Stärke zeigten, dass in Folge des Reizes der stärker strömenden reinen Luft die Schleimsecretion sogar zunahm, dass also die bei den Terpentinversuchen beobachtete Trockenheit nur Folge der Terpentinbeimengung war. Wurde dagegen eine 1 bis 2 procentige wässerige Terpentinlösung auf die Schleimhaut gebracht, dann begann dieselbe sogleich stärker zu secerniren, zeigte aber gleichzeitig eine Abnahme der Blutfülle. Die Schleimhaut blieb, nach Anwendung von unverdünntem Ol. terebinth., trocken; sie wurde runzelig, röthlich glänzend; das Epithel hob sich von seiner Basalmembran ab; es traten Veränderungen desselben ein, die man am ehesten mit croupösen Plaques vergleichen könnte; es entstanden die deutlichsten Ecchymosen.

Säuren (Essigsäure) bedingte bei örtlicher Anwendung eine stärkere Schleimbildung; nach innerlicher Verabreichung bemerkte man zwar keine Aenderung in der secernirten Schleimmenge, aber ein rascheres Zusammenballen des aus den Drüs'chen dünnflüssig und klarquellenden Schleimes.

Für die bisher so vernachlässigten Behandlungsmethoden der verschiedenen Schleimhautcatarrhe der Luftwege ergeben sich aus den obigen Versuchen ganz bestimmte Fingerzeige.

DISCUSSION.

Dr. B. FRÄNKEL, Berlin: I should like to add some remarks on the conditions of secretion in the nose and in the pharynx, though I have not had the opportunity of conducting experiments concerning secretion from mucous membranes. In the nose the presence of seriparous glands and their dependence on nervous influences has been proven by Heidenhain. There is also a pathological hyper-secretion of these glands, which I consider to be very essential for the coryza of asthma, and which is essentially different from the inflammation of the mucous membrane, generally called catarrh. There exist also in the pharynx seriparous glands and hyper-secretion. The latter disease is, however, to be diagnosticated only if direct observation of velum and of pharynx justifies the diagnosis—*i.e.*, if it shows that the tongue being depressed after a very short time the pharynx becomes covered with drops close together of an almost purely watery secretion. The complaints of a patient suffering from that form are somewhat manifold, a tendency to repeated swallowing being especially complained of, and there is frequently morning sickness, &c. Belladonna preparations cure this affection, and it is worthy of mention that belladonna generally produces not only a sensation of dryness, but actual dryness of the pharynx. I believe that the physiological moistening of the mucous membranes is altogether to be distinguished from catarrh, and I hope that the continuation of the highly important experiments of Professor Rossbach will perhaps clear up this question as well.

Professor ROSSBACH, Würzburg: I would urge that no analogies should be made regarding the conditions of secretion between nose, pharynx, larynx, and trachea. I agree with Dr. Fränkel that in the nose, and probably also in the pharynx, central influences act upon the mucous secretion, in the latter, *e.g.*, in a reflex manner for coating the bolus, &c. In the trachea, on the other hand, in spite of the most careful investigations made on human and animal tracheæ by my pupil Leussler, only acinous mucous glands, never seriparous ones, have been found, and consequently a serous secretion cannot at the present time be admitted for the trachea. Some of my experiments, notably the cooling ones, have I think influenced the tracheal mucous membrane in a manner very closely resembling that of catarrh.

Einfluss des weiblichen Geschlechtsapparats auf Stimm-Organ und Stimmbildung.

Dr. BAYER, Brussels.

Meine Herren! Erlauben Sie mir vor einer so competenten Gesellschaft über ein Thema zu sprechen, worüber viele von Ihnen vermöge grosser Erfahrung gewiss interessantere Mittheilungen zu machen im Stande wären, als ich es bin. Aber eben desshalb habe ich das Thema gewählt, um die einzelnen Herren zu veranlassen ihre diesbezüglichen Beobachtungen nicht der Vergessenheit zu übergeben, sondern sie bei gebotener Gelegenheit zu veröffentlichen.

Ich habe mir nämlich vorgenommen zu sprechen über den "Einfluss des weiblichen Genitosexualapparates auf das Stimmorgan und die Stimme."

Das Thema ist nicht neu, und beinahe jeder Tag bringt dem beschäftigten Laryngologen dasselbe in Erinnerung. Aber auch die Gynäcologen und Neuro-

logen schenken demselben die verdiente Berücksichtigung und lassen es an interessanten Mittheilungen und Würdigungen nicht fehlen.

Zuvörderst will ich kurz einige Autoren erwähnen, welche auf diesem Felde gearbeitet und den Weg gebahnt haben, und kann natürlich nicht umhin, vor allen Vater Hippocrates zu nennen, welcher mit seiner Bezeichnung "Hysterie" und seinem Ausspruch, "Mulier tota in utero" schon an unser Thema gedacht hat.

Die wahre Würdigung und das eingehende Studium der Frage gehört der laryngoskopischen Zeit an. Zu nennen sind vor Allen Türck, Gerhardt, von Bruns, Morell Mackenzie, Fournié, Störk, Krishaber, Mandl, Schnitzler, Lewin, Nicolas-Duranty, Handfield, Jurasz, Thaon und viele andere, welche ich nicht alle aufzählen will; ausserdem Kussmaul, Landry, Eulenburg, Chairon, Lecorché und Thalamon, Laségue und Martineau—Gynäcologen und Neurologen, welche sich mit der Frage näher beschäftigt und Mittheilungen darüber gemacht haben.

Complicirt, wie der Kehlkopf ist in seinem anatomischen Bau und seinen physiologischen Functionen, erleidet er leicht verständlich eine Beeinflussung ersten Ranges durch den weiblichen Genitosexualapparat, welcher eine Hauptstation bildet in dem weiblichen Nervensystem, und häufig, darüber sind die Autoren einig, ist es der Kehlkopf zuerst, wo sich eine Affection eben dieses Apparates manifestirt. Verfolgen wir das Bild telegraphischer Leitung weiter, so finden wir als Innervationscentrum, von welchem die Depeschen aufgenommen und ausgesandt werden, die Medulla oblongata, respective den Halstheil des Rückenmarks; als vermittelnde Bahnen die ganze Cerebrospinalsäule; und als Leitungsdrähte die Bahnen des Sympathicus einerseits, die des Vagus und Accessorius andererseits. Schon im physiologischen Zustand sehen wir obigen Einfluss sich geltend machen. Zur Zeit der Pubertät z. B.—freilich weniger ausgesprochen als beim männlichen Geschlecht—veranlasst die Entwicklung der Geschlechtstheile eine Ernährungszunahme des Kehlkopfes. Seine Dimensionen nehmen zu, hauptsächlich im vertikalen Durchmesser, aber auch die Stimmbänder verlängern sich, und es entsteht damit nothwendig eine Veränderung in der Stimmlage; der "Stimmwechsel" hat Statt.

Ob frühzeitige Entfernung der Ovarien diese Entwicklung verhindert, nach Analogie des männlichen Geschlechts, darüber sind keine Erfahrungen bekannt gemacht worden. Menstruation und Schwangerschaft sind von entschiedenem Einfluss auf den Kehlkopf. Nicht selten beobachtet man zur Zeit des Menstruationseintritts und der Menopause reflectorische Reizerscheinungen im Larynx unter einer der verschiedenen Formen der Larynxneurosen, welche mit hergestelltem Gleichgewichtszustand des Gesammtorganismus wieder von selbst verschwinden. Ich habe in der letzten Zeit wieder zwei junge Mädchen mit bellendem Husten und kaum nennenswerther Röthung der Aryknorpel behandelt, wo der Husten mit Eintritt der Periode plötzlich ausblieb.

Türck berichtet einen Fall von vorübergehender Aphonie zur Zeit der Menstruation.

Ich habe eine Opernsängerin behandelt, welche jedesmal zur Zeit ihrer Periode eine Hyperämie der Larynxschleimhaut mit Auflockerung der Stimmbänder hatte, so dass ich beim ersten Male an eine schwerere Affection dachte. In Zeit von 1 bis 2 Tagen war alles wieder in Ordnung und die Stimme vorzüglich.

Was die Schwangerschaft anbelangt, so sah ich bei einer Dame das Gefühl einer Art Globus im Larynx bei eintretender Schwangerschaft schwinden, während ich sie noch mehrere Wochen an einem chronischen Kehlkopfcatarrh weiterbehandeln musste. Eine andere Patientin (Sängerin) war nie so gut bei Stimme als während der Schwangerschaft. Ich behandelte sie an einem hartnäckigen Kehlkopfcatarrh.

Gehen wir nun zum pathologischen Zustand über, so sehen wir vor allen anderen Affectionen des weiblichen Genitosexualapparates am meisten, wenn auch nicht ausschliesslich, die Erkrankungen der Ovarien und des Uterus einen reflectorischen Einfluss auf den Kehlkopf respective die Stimmbildung ausüben.

Es gehören hieher von Seiten der Ovarien sowohl Veränderungen des Drüsengewebes, wie Hyperplasien, respective Neubildungen, als Veränderungen des Ovarialstromas, wie Oophoriten, Hämorrhagien, Hyperplasien, etc., ferner Veränderungen ihrer Lage, respective ihrer Umgebung, wie Dislocationen, Perioophoriten, Hämatoma retrouterinum, etc.

Von Seiten des Uterus sind zu nennen: Erkrankungen der Uterinalschleimhaut, wie Catarrh, Hyperplasien, Polypen, Epithelialneubildungen, Ulcerationen, etc.

Ich habe zwei Fälle ziemlich unbedeutender Papillarwucherungen des Scheidentheils des Uterus Suffocatio uterina bedingen sehen, welche mit Entfernung der Papillome alsbald verschwand.

Ferner gehören hieher die Erkrankungen der Muskelschicht, Veränderungen der Uterushöhle, und endlich die verschiedenen Lageveränderungen des Uterus, sowohl Versionen und Flexionen, als Senkungen und Prolaps.

Gerade hier bietet die Literatur ganz interessante Fälle, von welchen ich des Interesses halber einige anführen will.

Bekannt ist der Fall von Landry, wo sich bei einer aphonischen Patientin die Stimme sofort wieder einstellte, als man den anteflectirten Uterus in seine normale Lage zurückbrachte.

Sehr lehrreich sind zwei Mittheilungen von Martineau (Traité clinique des affections de l'uterus, 1878).

Der erste Fall betrifft eine Frau, welche während eines ganzen Jahres von einem sehr hartnäckigen, beständigen, trockenen Husten gequält war, der sie sehr erschöpfte. Alle Mittel waren vergebens gegen den "nervösen Husten" angewandt worden. Nachdem die chronische Metritis der Patientin geheilt respective die vorhandene Anteversion mit Pessarium und Leibgürtel corrigirt war, verschwand der Husten plötzlich, um alsbald wiederzukehren, wenn Patientin Pessarium und Leibgürtel entfernte, respective der Uterus seine fehlerhafte Lage wieder einnahm. Reponirte man dann wieder den Uterus, so verschwand der Husten von Neuem.

Der zweite Fall betrifft eine Dame mit Senkung, und Anteversion des Uterus. "Aphonie et Mutité."—"Si l'on soulève doucement l'uterus avec le doigt et qu'on remette l'organe en place, immédiatement la voix revient, la respiration se rétablit. Les accidents reparaissent, quand l'uterus retombe..." Electricität, Morphin, Strychnin, Chloroform haben nur eine palliative Wirkung und schlagen schliesslich ganz fehl. Aber immer setzt die Reposition des Uterus die Patientin in den Stand mit lauter Stimme einige Worte auszusprechen. Sobald der Uterus aber seine fehlerhafte Lage wieder einnimmt, tritt von Neuem vollständige Stimmlosigkeit ein.

Weiterhin kommen hier in Betracht die verschiedenen Erkrankungen der breiten Mutterbänder, der Eileiter, und schliesslich der Vagina und Vulva.

Ich habe eine Dame behandelt, welche schon lange Zeit in gynäcologischer Behandlung stand, und ausserdem noch wegen beständiger Hustenanfälle und Hustenreizes an "Bronchite chronique" behandelt wurde. Die laryngoscopische Untersuchung und Behandlung ergab ein ungenügendes, nicht entsprechendes Resultat. Ich drang wiederholt auf genaue Untersuchung mit dem Speculum, da entdeckte endlich ein hiesiger Gynäcologe, Freund von mir, eine ganz feine Urethrovaginalfistel mit deren Verödung sowohl Pruritus vaginae, und häufiger Drang zum Uriniren, als auch die Symptome von Seiten des Larynx wie mit einem Male beseitigt waren.

Um nun näher einzugehen auf die Besprechung der verschiedenen Formen, unter welchen sich die Theilerscheinungen der Affectionen des weiblichen Genitosexualapparates im Larynx manifestiren, können wir drei Rubriken aufstellen:

1) Die Aesthesioneurosen oder Störungen der Sensibilität;
2) Die Kinesioneurosen oder Störungen der Motilität;
3) Die Trophoneurosen beziehungsweise Angioneurosen.

Beginnen wir sofort mit letzteren und sagen wir kurz, dass sie eigentlich nur des Systems halber in Betracht kommen. Doch müssten hier etwaig vorkommende "vicariirende" Blutungen der Kehlkopfschleimhaut eingereiht werden. Das Capitel ist dunkel, wie überhaupt das der visceralen Trophoneurosen.

Wir haben es daher ausschliesslich mit den zwei ersten Rubriken zu thun.

Die Formen, unter welchen dieselben auftreten, kommen theils als reine Formen vor, theils, und das ist die Mehrzahl, als unter sich combinirte.

An absoluter Häufigkeit tragen wohl die Aesthesioneurosen den Sieg davon. Dieselben kommen zu Stande, sobald durch eine der oben angeführten Ursachen die mittlere Erregbarkeit und Widerstandsgrösse innerhalb des Empfindungsapparates eine Veränderung erleidet, und dadurch ein Missverhältniss entsteht zwischen der Reizstärke und der Reaction im Bewusstsein, das heisst, der Stärke der percipirten Empfindung. Handelt es sich dabei um ein Plus der Reaction gegenüber dem einwirkenden Reize, so haben wir es zu thun mit der Hyperæsthesie. Dabei erlangt "die ankommende Erregung erst nach Ausbreitung über zahlreiche Ganglienzellen den Schwellenwerth, und in Folge dessen werden excessive, das gesetzliche Maass überschreitende Reactionen im Bewusstsein ausgelöst. (Eulenburg.)

Die Hyperæsthesie ist die häufigste Larynxneurose. Sie bildet einen Hauptfactor der meisten andern Larynxneurosen, wie der Paræsthesien, des Spasmus glottidis, der Suffocatio uterina, des nervösen Krampfhustens, der Phonophobie und anderer. Als reine Form wird sie weniger häufig beobachtet, und es ist eigentlich nur dem Laryngoscopiker vorbehalten eine quantitativ gesteigerte Reaction im Kehlkopf nach Application eines bekannten Reizes zu constatiren.

Tritt nun das entgegengesetzte Verhältniss ein, das heisst, handelt es sich um ein Minus der Reaction gegenüber dem einwirkenden Reize, so haben wir es zu thun mit der Hypæsthesie und Anæsthesie.

Hier erlangen die Erregungen im Centrum zu früh den Schwellenwerth oder gelangen gar nicht zum Centrum. Daher bleibt die Reaction unter der gesetzlichen Norm zurück, oder wird völlig vermisst.

Die Hypæsthesien und Anæsthesien machen ebenfalls einen Bestandtheil der unten zu besprechenden Neurosen aus, welche man als Paræsthesien bezeichnet. Chairon wollte die Anæsthesie der Epiglottis als pathognomonisches Zeichen der Hysterie aufstellen. Ziemssen und andere haben jedoch diese Angabe wiederlegt. Nach Thaon begegnet man nur bei etwa dem sechsten Theil der Hysterischen mehr oder weniger vollständiger Anæsthesie der Epiglottis. Die Anæsthesie ergreift überhaupt den Kehlkopf in seiner ganzen Ausdehnung oder seinen einzelnen Theilen, ohne sich an einen Typus zu binden. Häufig ist sie von partiellen wie diffusen Hautanæsthesien begleitet. Bekannt ist der anästhetische Fleck an der vorderen Seite des Halses.

Hyperæsthesien und Anæsthesien, bei welchen homologe Reize heterologe Empfindungen auslösen, werden als Paræsthesien bezeichnet. Ihre Eigenthümlichkeit besteht in der Verschiedenheit der Qualität der durch einen Reiz ausgelösten Empfindung. Daher kommen die manchmal bizarren Bezeichnungsweisen, womit die Patienten ihr Leiden benennen. Die einen klagen über

Brennen, Stech-Gefühl der verschiedenartigen fremden Körper, welche in ihrem Halse stecken, andere über Globus, Titillatio, Kälte, &c., &c., so dass es gewöhnlich die Paræsthesien sind, welche man unter den Aesthesioneurosen zu diagnosticiren hat.

Wird schliesslich die Grösse der Gefühlscomponente des physiologischen Zustandes durch eine der oben angeführten Ursachen in ihrem Verhältniss zur Intensität des einwirkenden Reizes gestört, so haben wir es mit einer Dysæsthesie zu thun, und zwar mit einer Hyperalgesie, wenn jene abnorm gesteigert ist, mit Hypalgesie oder Analgie, wenn sie unter die Norm herabsinkt, oder ganz wegfällt. Gesellt sich den heterologen Empfindungen noch ein schmerzhaftes Gefühl im engern Sinne hinzu, so bezeichnet man sie als Paralgien.

Hieher gehörige Fälle sind von den Autoren mitgetheilt, gehören aber immerhin zu den Seltenheiten.

An die Aesthesioneurosen reihen sich die Kinesioneurosen oder Störungen der Motilität des Larynx an.

Die Erkrankungen des weiblichen Genitosexualapparates beeinflussen die psychomotorischen Centren auf sympathischem oder reflectorischem Wege unter Vermittlung der Ursprungszellen der excitomotorischen Fasern, welche in dem verlängerten Mark- resp. dem Halstheil des Rückenmarks, in dem "basalen Lautcentrum" liegen. Dadurch wird die Erregbarkeit des motorischen Nervenapparates des Kehlkopfs gestört. Es entsteht ein Missverständniss zwischen Reizstärke und der hervorgerufenen Reaction "der resultirenden Bewegung." Es ist entweder ein Plus der Reaction gegenüber dem einwirkenden Reize, oder ein Minus, im ersten Falle eine Hyperkinese, im letzteren eine Hypokinese oder Akinese.

Da aber die resultirenden Bewegungsreactionen oft anomaler Natur sind, so könnte man in der Mehrzahl der Fälle den Ausdruck "Parakinesen" dem der "Hyperkinesen" substituiren.

Zu den Parakinesen oder Hyperkinesen gehören die Laryngospasmen, welche mit solcher Heftigkeit auftreten können, dass schon tödtlicher Ausgang beobachtet wurde. Im Allgemeinen aber sind sie wenig gefahrdrohend. Eigenthümlich ist es, dass solche Patienten, selbst nach wenigen intensiven Anfällen von einer unendlichen Furcht geplagt werden in einem der Anfälle zu bleiben. (Tobold.)

Hieher gehören ferner die hysterischen Hustenkrämpfe, welche sich durch paroxysmatisch auftretende, zum Theil sehr heftige, trockene, oft mit pfeifendem oder bellendem Geräusch oder lautem Schrei verbundene Hustenanfälle characterisiren. Zu erwähnen ist hier der "Spasme laryngé somnambulique," welcher nach Thaon dadurch hervorgebracht wird, dass man den Larynx der hypnotisirten Patienten leicht mit dem Finger berührt. Die Emission der Töne soll sofort damit cessiren.

Die familiärsten Neurosen des Larynx bedingt durch obige Ursachen sind die Hypokinesen oder Akinesen, gewöhnlich als "Aphonia hysterica" bezeichnet.

Unter den Lähmungen Hysterischer ist die Stimmbandlähmung eine der gewöhnlichsten. (Eulenburg.)

Die Mehrzahl dieser Lähmungen characterisiren sich durch ihre Unregelmässigkeit, das oft plötzliche Kommen und Verschwinden, den Mangel successiver Ernährungsstörungen der Muskeln, durch völlige Integrität der faradomusculären und galvanomusculären Sensibilität. (Duchenne, Eulenburg.)

Es kommen Zustände herabgesetzter oder aufgehobener Motilität vor, welche wesentlich durch ein krankhaftes Gefühl einer Vorstellung, einen eingebildeten oder wirklich vorhandenen Defect an Willensenergie hervorgerufen und unterhalten werden "sogenannte ideelle Paralysen" nach Reynolds.

Ich habe neulich ein blühend aussehendes Mädchen von fünfzehn Jahren

behandelt. Der Kehlkopf war in absolut normalem Zustande. Die Stimmbänder bewegten sich tadellos. Es fehlte nur der Willensimpuls einen Ton hervorzubringen. Alle ordentlichen Mittel blieben erfolglos. Ein Gelübde an die "Notre Dame de Lourdes" löste eines schönen Tages die Aphonie! Hinterdrein trat periphere Hautanæsthesie auf.

Besprechen wir kurz die verschiedenen Formen der Akinesen, so sehen wir alle Grade vertreten von der leichten Abschwächung der Stimme aus bis zur completen Aphonie. Häufig beobachtet man Patienten, welche bei der Spiegeluntersuchung noch Töne hervorbringen, noch einen tönenden, klangvollen Husten haben, ja gar noch singen können. Man hat sogar Hysterische mit Aphonie im Traume reden hören. Diese Lähmungen sind es, welchen Tobold den Namen phonischer Lähmungen gegeben hat. Man unterscheidet drei Formen, je nachdem bei der Phonation vollständiges Klaffen der ganzen Glottis, oder nur partielles Klaffen derselben, oder endlich nur verminderte Vibration der Stimmbänder stattfindet. Auf die Details gehe ich nicht ein. Die wichtigsten Symptome ergeben sich durch die laryngoscopische Untersuchung. Es kommen dabei auch Respirationsstörungen vor, und es ist ein Fall bekannt von hysterischer Paralyse der Crico-arytænoidei postici, der zwei Mal die Tracheotomie erheischte.

Bemerkenswerth ist, worauf Gerhardt zuerst aufmerksam gemacht hat, das Fehlen der phonatorischen Vibrationen beim Auflegen der Hand aussen auf den Kehlkopf. Ganz besonders häufig scheint der Musc. arytænoid. transv. betheiligt zu sein, so dass die Aryknorpel nicht schliessen, und die Stimmbandlähmung so häufig doppelseitig ist.

Als besondere Eigenthümlichkeit ist noch die "Aphonia intermittens" zu erwähnen, wobei die Remissionen und Exacerbationen öfters ganz typisch sind. Tobold erwähnt einen Fall, wo sieben Jahre lang eine Patientin vom Erwachen an bis gegen 10 Uhr kräftig und klar sprach, dann aber ohne jede Veranlassung die Stimme für den ganzen Rest des Tages einbüsste. Eulenburg hat einen Fall beobachtet, in welchem die Stimme von 12 bis gegen 4 Uhr verschwand. Laryngoscopisch war in beiden Fällen während der freien Intervalle vollständig normale Excursionsfähigkeit und Vibration der Stimmbänder nachzuweisen. Thaon führt als Eigenthümlichkeit der hysterischen Aphonie an, dass sie von Tag zu Tag einen andern laryngoscopischen Befund geben könne.

Als dritte Form gehören zu den Kinesioneurosen noch die Coordinationsstörungen des Stimmorgans, "die Laloneurosen."

Nach Kussmaul verlieren "Hysterische oft für Minuten, Stunden, Wochen oder Monate nicht bloss die Stimme, sondern auch die Sprache. Die Wortbilder sind in solchen Fällen intact, und die Bahn zwischen Gedanken und Worten ist es gleichfalls. Aber es handelt sich hier um eine Unterbrechung irgendwo zwischen Bild und Musculatur, oder ist die gesammte corticale oder infracorticale Erregung, durch die der Begriff in das äussere Wort umgesetzt wird, zu schwach, und wirkt das Traitement moral durch die Kräftigung dieser Erregungsvorgänge mittelst des psychischen Reizes?" Kussmaul theilt dies bezüglich zweier Fälle mit.

Um endlich zum Abschluss zu kommen, so liegt es auf der Hand, dass der durch Erkrankungen in der weiblichen Genitosexualsphäre beeinträchtigte Ernährungszustand des Gesammtorganismus sich sehr bald auch im Kehlkopf mit seinem complicirten Muskelapparate geltend machen, und Functionsstörungen dieses Organs hervorrufen muss. Und in der That oft schon unbedeutende Schwächezustände geben sich als stimmbeeinträchtigend kund, und verschwinden mit der Besserung des allgemeinen Ernährungszustandes.

Therapie, Diätetik und Hygieine stehen consequenterweise im innigsten Zusammenhang mit der Diagnose, welche unser besprochenes Thema im gehö-

rigen Maasse berücksichtigt. Die Localbehandlung wird unendlich erleichtert und unterstützt, ja oft: "Sublata causa tollitur effectus."

DISCUSSION.

Dr. E. Fränkel, Hamburg: I would by no means deny the intimate relations between diseases of the genital organs and neuroses of sensation, but I would warn against exaggeration in this respect. As a proof, I will quote a case in point concerning a young lady suffering from stenosis of the cervix, and, at the same time, from severe paræsthesia in the pharynx and larynx. The throat affections have been cured by appropriate local treatment with the constant current, whilst the trouble in connection with the dysmenorrhœa, and caused by the stenosis are still in existence. I will here mention the occurrence of *points douloureux* on the neck corresponding to the points of egress of the superior laryngeal nerve when tested with the constant current. With the disappearance of the pain the nervous symptoms also disappear. These neuroses are to be treated by means of the ether spray directed against the points of egress of the superior laryngeal nerve (Rossbach's method).

Dr. Felix Semon: From my own experiences, I would deduce the general practical rule that in all doubtful cases attention is to be paid to the state of the genital organs, and that they are to be properly attended to, but that the discovery of a uterine disorder does not at once justify a very sanguine prognosis as to the curability of the laryngeal complaint.

A Contribution to the Pathology of the Nasal Mucous Membrane.

Dr. F. H. Bosworth, New York.

In years past it has been the usual practice to accomplish the removal of the thickened tissues which are met within the nose in connection with nasal catarrh by means of destructive agents, such as the galvano-cautery, chromic acid, and other caustics. This will account for the fact that our literature furnishes but scant information concerning the true nature of inflammatory diseases involving this region. For some time I have almost entirely abandoned these destructive agents for the ingenious little wire snare écraseur devised by Dr. W. C. Jarvis of New York.

This instrument has enabled me to remove the offending tissue with less pain and less reaction, and with much more satisfactory results than the more severe caustic agents. Above all, however, it has enabled me to remove the morbid tissue in small masses, and in such a manner that I have in every instance been afforded an opportunity of investigating, by means of the microscope, the true nature of the morbid process.

Following up these investigations, I have extended my research into both the hypertrophic form and the atrophic form of the disease, though it need not be mentioned that in the latter the operation was of course not indicated. I may state, however, that, as a matter of clinical observation, and to my great surprise, in every case in which I removed pieces of membrane in the atrophic form of the disease there resulted a decided improvement in the disease.

The examinations have been made of membrane removed from the middle and lower turbinated bones, both anteriorly and posteriorly. The membrane of the superior turbinated bone I have very rarely found diseased. Without occupying your time now, I will describe the conditions found in the two forms of disease—viz., rhinitis hypertrophica chronica and rhinitis atrophica chronica.

I. Rhinitis Hypertrophica Chronica.

The epithelial layer.—This layer is very markedly increased in width, and its surface deeply corrugated. There are deep valleys running downward into the adenoid layer, which are filled with stratified epithelial cells. These latter consist of elongated epithelia displayed in from ten to twelve layers. The outermost layer, from specimens taken from the middle turbinated bone, exhibits fine ciliæ, while in the specimen taken from the lower turbinated bones, the ciliæ of this surface layer are found only on patches as it were. The layer nearest to the adenoid tissue, or the mucous membrane proper, is occupied by distinctly developed large columnar epithelial cells, which, especially where they go to fill the valleys mentioned before, are very large and composed of several strata.

The boundary line between the epithelial layer and the adenoid tissue is distinct everywhere; in some places there is even present a layer without distinct structure, the so-called structureless membrane.

The adenoid layer.—This layer is also markedly increased in width above the normal. It is composed of a myxomatous reticulum filled with very numerous and even densely crowded lymph corpuscles, in the more recent cases, whilst in cases of long standing the lymph corpuscles seem to be rather scantily displayed, and the whole mucosa is composed of very dense decussating bundles of fibrous connective tissue. The mucosa in all instances is richly supplied with capillary blood-vessels, mostly filled with blood. In this layer also we find the acinous glands very numerous, evidently increased in size and number also. They are lined with cuboidal epithelial cells, which in many instances exhibit the features of inflammatory corpuscles. The ducts of these glands are traceable to the surface, where they open as a rule into the valleys noticed in the surface layer of the membrane, when their epithelia blend with that of the outer epithelial coat.

The submucous layer.—Beneath the adenoid layer there is found a broad layer of myxomatous or fibrous reticulated structure in which enormously enlarged blood-vessels are present, of a venous character. This is the layer alluded to by Kölliker and Kohlrausch, and subsequently described more accurately by Bigelow as composing a true erectile tissue in the normal mucous membrane. The connective tissue between these larger veins, however, is broader than in the normal cavernous tissue, and is supplied with bundles of smooth muscular fibres. The muscular coat of the veins is also increased in breadth.

The arteries of this layer, although scantily displayed, are all of a wavy course, constituting the so-called helicine arteries. This submucous layer also contains a large number of racemose mucous glands increased in size and number. The presence of these glands in this submucous layer, as far as I know, is anomalous. Surrounding these glands there are noticed heaps or masses of lymph corpuscles.

We find, therefore, that the changes which take place in the hypertrophic form of the disease may be briefly summed up as follows:—

1.—Hypertrophy of the surface layer, resulting in augmentation of the covering epithelium, without desquamation.

2.—Hypertrophy of the adenoid layer, resulting in an increase or thickening of the layer; an increase of its capillaries with stagnation of blood, and a new formation of fibrous connective tissue, replacing the adenoid layer.

3.—Increase in the size and number of the racemose glands both in the adenoid and submucous layer.

4.—Hypertrophy of the connective tissue between the enlarged veins in the submucous layer.

II. Rhinitis Atrophica Chronica.

In this form of inflammation the membrane is thin, shrunken, and bloodless.

The epithelial layer.—This layer is markedly decreased in width. The outer nearly smooth surface is occupied by a relatively broad layer of flat epithelia partially in a state of desquamation. Below this we find stratified cuboidal epithelia displayed in five or six layers, while the portion nearest to the adenoid layer is occupied, in some regions at least, by columnar epithelium; where the latter is plainly visible, the boundary line between the epithelial and the adenoid layer is plainly marked. In many places, however, such a boundary is not traceable, and the adenoid layer blends with the epithelial coat, while the latter at the same time exhibits many features which are similar to those of the adenoid layer of the membrane.

The adenoid layer.—This layer is thinner than normal, and is occupied by lymph corpuscles, crowded together in quite a marked manner, and supported by a delicate fibrous reticulum. The blood supply of this layer is very scanty; the number of the capillaries being notably small, while their calibre is, as a rule, narrow. Moreover, in nearly every instance they are quite empty —containing no blood.

The adenoid layer merges into the submucous layer, a layer of a more fibrous construction, with relatively less numerous lymph corpuscles; this layer also exhibits very scanty acinous glands; these glands and their ducts being notably diminished in calibre, but also in number. Their acini are lined by short columnar and cuboidal epithelium, while the ducts exhibit, around a large calibre, well-defined columnar epithelium. Around the scanty acinous glands there are seen heaps of lymph corpuscles. This submucous layer shows a somewhat larger number of blood-vessels than the adenoid layer, which also on an average exhibits a wider calibre. The characteristic feature, therefore, of the atrophic form of the disease may be summed up as follows:—

1.—Diminution or atrophy of the epithelial layer of the membrane with loss of the ciliæ, together with evidences of profuse desquamation.

2.—Diminution or atrophy of the adenoid layer, attended with lack of blood-vessels and destruction of the acinous glands.

3.—Destruction of the submucous erectile tissue, the tissue being converted into a more or less dense fibrous structure containing no blood spaces whatever.

There are certain general deductions which may be drawn from these investigations, in the statement of which I shall endeavour to be very brief.

The nature of hypertrophy of the nasal mucous membrane has long been recognized by all of us, and I do not know that I have been able to do more in my investigation than to confirm opinions for a long time entertained.

I will only say then, in regard to this form of the disease, that the logical deduction from the true nature of this form of disease is that its proper treatment demands its ablation, and that in the use of douches, sprays, and mere cleansing and astringent washes we can afford but a doubtful temporary relief. I will only say further, as intimated at the opening of my paper, that with the use of the little wire snare of Dr. Jarvis, I have been able to accomplish the removal of morbid tissue, not only with success, but also with comparatively little hæmorrhage or pain, and with no secondary inflammation.

In the atrophic form of the disease, I think the investigation throws much light on many unsettled questions. It is a very prevalent opinion that an atrophic catarrh may result as a later stage of the hypertrophic disease. This opinion I for a long time held and taught. This view cannot be entertained.

In rhinitis atrophica we have a form of inflammation which, from its outset,

is different from the hypertrophic form. It consists in a degenerative change which, apparently, has its origin in the epithelial lining of the acini, leading soon to a more or less profuse desquamation, which in time results in a loss or impairment of function of the glandular structure of the membranes, and subsequently to their atrophy. This I believe to be the starting-point of the disease, and the condition from which all the subsequent phenomena arise.

The subsequent progress of the morbid changes may be briefly stated as follows:—The loss of glands robs the mucous membrane of that proper supply of mucus by which it is kept in a moist and pliable condition. As the result of this, there is poured out upon its surface a thick and scanty mucus, deficient in its watery constituents. The result is, that it dries upon the surface of the membrane, forming a dry, parchment-like pellicle, coating and adhering to its surface. In drying, this pellicle necessarily contracts, exerting a slight pressure on the tissues beneath; a pressure which is very slight, but continuous. This process, being continued through months and years, results, not only in promoting the original atrophic change in the membrane, but also results in inducing that shrinking of the turbinated bones which is so common a feature of the later stage of the disease. It is also by this pressure that we find the erectile tissue of the middle and lower turbinated bones disappearing and giving place to the fibrous structure which is found beneath the adenoid layer in the atrophic disease.

A still further result is, that as these dry pellicles are formed, mucus is secreted beneath them. This mucus is imprisoned; it does not lose its moisture, but, being retained, it undergoes degeneration and stinks, giving rise to the odour which is so common in this disorder. The crusts are lifted from below, and piled up, as it were, by the secretion of the membrane, and then result large and offensive masses, which are discharged at intervals of from three to five days. This, in brief, I believe to be the manner in which, from simple degenerative changes commencing in glands of the mucous membrane, there result the so-called dry catarrh and its sequence, ozæna.

As to the causes of the disease, with our present knowledge, little can be said. I do not believe that syphilis has any connection whatever with ozæna. Syphilis in the nose gives rise to ulceration and necrosis; ozæna never gives rise to either ulceration or necrosis.

I have sought for evidence, clinical and otherwise, of the syphilitic taint in patients suffering from ozæna, but have never found it. The same may be said of struma, and all other depressing diatheses. I have never been able to connect ozæna with any general constitutional condition, although we are generally taught in literature the contrary.

It is, then, a purely local disease in its outset, and any impairment of health which attends it—and I will say that I believe this to be rare—is due to the disease, and that the bad air that the sufferer from the disease breathes, is the cause of the impaired health.

DISCUSSION.

Dr. Krause, Berlin: I desire to draw attention to the quantity of fatty detritus, and to the numerous fat globules in the atrophic nasal mucous membrane, clearly visible in Dr. Bosworth's microscopical specimens. This seems to me a constant occurrence, besides the other changes, such as shrinking, and even total disappearance of the glands, &c. I shall have to refer to this fatty metamorphosis in the discussion on ozæna.

Du rôle de la portion libre de l'épiglotte et des fossettes glosso-épiglottiques.

Dr. Guinier, Cauterets.

Au cours d'un repas, l'observation constate les faits suivants :

La pulpe ou le bol qui résulte de la trituration et de l'insalivation de la bouchée disparaît de la cavité buccale et s'accumule dans les fossettes glosso-épiglottiques, comme sur un palier d'attente, avant toute déglutition.

La contraction progressive du constricteur supérieur du pharynx et des piliers postérieurs renforce la résistance de la portion libre de l'épiglotte contre la pression du bol s'accumulant dans le sillon glosso-épiglottique.

La présence du bol dans le sillon provoque le besoin de déglutir, d'autant plus impérieux que la masse à déglutir est plus volumineuse et que la mastication est plus avancée.

Le besoin de déglutir est une sensation musculaire spéciale, comme le besoin de défécation.

Comme toute sensation du même genre le besoin de déglutir est soumis à la volonté ; la déglutition peut être retardée ou même refusée. Une excréation rejette alors le bol déjà parvenu contre l'épiglotte.

Mais, si l'on cède au besoin de déglutir, il se produit aussitôt dans l'appareil de déglutition, proprement dit, une série de contractions réflexes, et le bol franchit brusquement le pharynx œsophagien pour se précipiter dans l'œsophage.

Donc, au moment où le besoin de déglutir apparaît, le bol a déjà dépassé l'isthme du gosier ; il est parvenu contre le bord libre de l'épiglotte ; il a déjà subi l'action du dos de la langue, de la voûte palatine, du voile et des piliers ; et il est certain que l'acte de déglutition n'est pas encore commencé.

Tous les phénomènes observés jusque là n'ont eu pour but que la formation du bol, la disposition de la masse pour une facile déglutition ; ils n'ont agi que comme phénomènes préparatoires de l'obligation de déglutir. Ces phénomènes appartiennent donc exclusivement à la mastication.

Pour la facilité des études physiologiques, pathologiques et thérapeutiques, le pharynx anatomique doit être divisé en trois portions distinctes :—1. Un pharynx nasal ; 2. Un pharynx buccal ; 3. Un pharynx œsophagien.

C'est à l'entrée épiglottique du pharynx œsophagien que le bol s'établit pendant la mastication, et c'est au niveau de l'étranglement pharyngo-épiglottique que se produit surtout la sensation du besoin de déglutir.

L'arrêt du bol contre l'épiglotte et la coëxistence d'un besoin avec cet arrêt se retrouve au pylore et au rectum. Au pharynx, au pylore, au rectum, il y a analogie de mécanisme.

Arrêt de la masse alimentaire pour la transformation de la bouchée originelle, en bol dans le sillon glosso-épiglottique, en chyme au pylore, en excrément au rectum.

Obstacle à franchir sous forme de sphincter.

Accumulation progressive contre l'obstacle à mesure que la fonction s'accomplit.

Sensation organique de besoin pour la progression de la masse, perceptible au pharynx et au rectum, non perçu au pylore.

Ainsi obstacle à franchir, arrêt de la masse à déglutir, accumulation de cette masse dans un réservoir d'attente jusqu'à concurrence d'un volume déterminé par la capacité du réservoir d'attente, sensation organique d'un besoin, tels sont les phénomènes caractéristiques qui précèdent toute déglutition.

Conclusions.—1.—La portion libre de l'épiglotte joue le rôle de margelle de larynx pendant la mastication de la bouchée.

2.—Les fossettes glosso-épiglottiques sont le réservoir d'attente du bol alimentaire préparé pour une déglutition.

3.—La déglutition de l'aliment commence seulement au niveau du trou pharyngo-épiglottique, après qu'il a subi déjà l'action de la langue, de la voûte, du voile et des piliers, et qu'il a dépassé l'isthme du gosier par une marche régulière sans aucun mouvement convulsif.

4.—Le mécanisme de la mastication comprend :

(*a*)—La trituration de l'aliment.

(*b*)—La transformation en bol par l'association de la trituration et de l'insalivation.

(*c*)—Son transport successif à l'état de bol naissant, dans les fossettes glosso-épiglottiques par l'action combinée de la langue, de la voûte et des piliers.

(*d*)—Son accumulation, dans le réservoir d'attente glosso-épiglottique jusqu'à ce qu'une déglutition vienne l'y prendre pour le précipiter en un seul temps au pharynx œsophagien, dilaté et agissant comme ventouse, dans la profondeur de l'œsophage.

CLINICAL DEMONSTRATIONS.

Dr. Morell Mackenzie sent a patient for exhibition on whom he had performed internal œsophagotomy. The instrument was shown at the same time. He also sent a patient suffering from spasm of the tensors of the vocal cords (stammering of the vocal cords).

Dr. G. Vivian Poore showed the patient with web in the larynx, whose case he had communicated.

Dr. Felix Semon showed five cases of bilateral paralysis of the abductors of the vocal cords (posterior crico-arytenoid muscles), and gave a short report of the individual cases, dwelling upon the fact that the origin of the disease in some of them was of a central, in other ones of a peripheral, character. In one of the cases anchylosis of the right crico-arytenoid articulation had supervened later on.—He further showed a case of anchylosis of the left crico-arytenoid articulation, with atrophy of the corresponding vocal cord, which was fixed in the median line in a woman aged thirty, the subject of late hereditary syphilis.—He also showed the larynx, pharynx, and thyroid gland of a goîtrous patient suffering from carcinoma of the œsophagus, who had died from retro-tracheal hæmorrhage during the performance of tracheotomy. The post-mortem examination showed that an abscess cavity had formed between œsophagus, trachea, and right lobe of the thyroid body, which communicated posteriorly through a small opening with the œsophagus, anteriorly through a large one with the trachea. The latter being situated just opposite the place of the artificial incision, the pilot of the canula had penetrated straight through the trachea into the abscess cavity, and, injuring there some superficially situated thin-walled veins, had caused the fatal hæmorrhage.

Dr. W. McNeill Whistler, London, showed a case of specific pharyngeal stenosis, in which he had established a connection between the oral and nasal parts of the pharyngeal cavity, which previously had been separated from one another by newly-formed cicatricial tissue. He also showed a patient in whom a similar condition still existed.

Dr. Foulis, Glasgow, showed two larynges he had removed during life; the one the seat of sarcomatous, the other of carcinomatous, disease.

Dr. MICHEL, Cologne, demonstrated his method of removing adenoid vegetations from the vault of the pharynx by means of the galvanocaustic loop.

Dr. CRESSWELL BABER, Brighton, exhibited a self-retaining nasal speculum, and a snare which could be fixed at any angle.

Dr. BOSWORTH, New York, showed the nasal snare which he uses, insisting on the advantage of using No. 5 piano steel wire.

Dr. FOULIS, Glasgow, showed his apparatus for heating the actual cautery. He also exhibited instruments for removing the larynx and plugging the trachea, as well as models of several of the artificial larynges now in use, including his own modification of Gussenbauer's contrivance.

Dr. B. FRÄNKEL, Berlin, exhibited his modification of Whitehead's mouth-dilator, consisting in the addition of a tongue-depressor, which forms part of the instrument itself, and of a self-retaining Voltolini's palate hook, which is fixed to the instrument after introduction by means of a simple screw. He also showed prisms for the better illumination and inspection of the nasal, aural, and other cavities of the body.

Dr. PROSSER JAMES, London, demonstrated a series of pharyngeal and laryngeal instruments, the distinguishing feature of which consists in the fact that each is forged of one piece of steel, and in the sickle-shape of the cutting blade of many of them, which, varying as it does in size, according to the nature and size of the parts to be removed (tonsils, uvula, laryngeal growths), possesses the common advantage that it cannot injure the healthy parts.

Prof. KRISHABER, Paris, showed a series of tracheotomy tubes, which, besides offering advantages for easy introduction, represented certain distinct calibres with corresponding numbers, based upon a distinct relationship which he had found existing between the patient's body and the diameter of the trachea. He had given his tubes numbers corresponding to different heights of the human body, which would be found to fit perfectly the size of the patient's trachea. Consequently, if a surgeon living in the country desired to have at once a tube answering the requirements of his case, after the adoption of his principle, it would only be necessary to forward an exact statement of the patient's height in order to be sure of receiving a suitable tube.

Dr. MORELL MACKENZIE'S new œsophagoscope was exhibited.

Dr. RUMBOLD, St. Louis, showed his spray-producers.

Prof. STÖRK, Vienna, sent his œsophagoscope.

Dr. TORNWALDT, Danzig, showed an india-rubber tampon, to be inflated with water, for the gradual dilatation of laryngeal stenosis from the wound after tracheotomy had been performed.

Mr. SPENCER WATSON, London, showed a self-retaining nasal speculum and other nasal instruments.

Prof. CADIER, Paris, showed his tube laryngoscope, which could be fixed to

any ordinary lamp and permitted of some inclination, so that the patient could under all circumstances retain his position.

Dr. GOODWILLIE, New York, demonstrated the use of a surgical engine, similar to that used by dentists, for drilling exostoses in the nasal cavity.

Prof. VOLTOLINI, Breslau, showed his new and exceedingly simple battery, which can be used not only for the galvanic and faradic currents, but also for galvanocaustic currents of any strength. He further demonstrated an ingenious mode of removing needles and other articles of iron from the larynx by fixing them from without by means of a powerful magnet and then introducing a knitting-needle, to which they attach themselves.

Prof. CASELLI, Reggio Emilia, showed a new galvanocaustic tracheotome of which he gave the following description:—It is made after the model of Laborde's dilator, mounted on a long handle curved like the letter S. One of the lateral branches carries at its extremity a lancet point of platinum, while the other parallel is isolated by a little plate of ivory. The central branch is in the form of a platinum knife, and, moving along the middle simultaneously with the opening of the instrument and the separation of the two lateral branches, this central branch retreats in a series of movements and fixes itself in a special socket: thus the instrument remains open of itself, leaving the hand of the operator free. On the back of the instrument are three ivory buttons, marked with appropriate letters. Under these letters are a series of connections by which the electrical contact is made and broken. At the free end of the handle are two metal branches, to which the wires from the battery are attached. Holding the instrument in the right hand and touching the first button, marked P, with the forefinger the platinum point, so that without any assistant the operator can fix the larynx with the thumb and forefinger of the left hand, the point of the instrument enters the trachea at the place selected, passing easily through the tissues. The cessation of resistance and the sound leaving the tracheotome notify the entrance of the instrument into the tracheal cavity. Releasing now the first button, press the second one, supporting the thumb and middle finger on the two small lateral wings of the instrument. The point then suddenly cools down and ceases to burn the parts: on pressing the second button and closing the lateral wings the galvanocaustic knife retires, cutting the tissues in their entire thickness in front of the trachea and the tracheal wall also, while the two other branches open the cut parts. When the opening is large enough to allow the canula to be put in, release the buttons, whereupon the instrument cools down at once. You have now a cold and blunt dilator of Laborde's pattern *in situ*, and you may proceed at your ease to insert the canula, and touching then the button marked S, the blades close, and may be withdrawn from the wound. If, owing to want of thorough knowledge of the details, any hæmorrhage should be set up, it is easy to touch the button P, which heats up the platinum points, with which the bleeding-point may then be securely cauterized.—Prof. Caselli also showed a new artificial larynx in ebonite, which he described as follows:—I show you to-day a new larynx made of ebonite, which has the advantage over the other in use of being very durable, very light (only weighing 25 grammes), and of very moderate cost, the price being about 75 livres of Italian money (£3). I submit it for your examination, and hope to have your approval. It is composed of a tracheal canula, with an aperture in the convex part. Through this aperture is introduced the ascending tube, which is articulated at its middle, so as to adapt itself to the parts and to the movements of the tongue. At the

upper end there is a vibrating reed. The outer orifice of the tracheal canula is provided with a valve, opening from without inwards. When the patient inspires, the valve opens, and air enters the lungs, and when he expires, the valve closes, so that the air travels along the ascending tube, and causes the reed to vibrate, and causes the sound of the voice. When the patient eats, he takes out the ascending branch and inserts an inner tube in the tracheal canula. This occludes the upper aperture. The anterior orifice may also be protected by a perforated button to prevent the introduction of foreign particles into the trachea.

Dr. Meyer, Copenhagen, exhibited the instruments which he employs for the removal of adenoid vegetations.

Dr. Böcker, Berlin, showed an improved gas lamp, having the advantage of extraordinary illuminating power, and a tonsillotome of a new description.

In the course of the proceedings the following resolution, moved by Prof. Schnitzler, Vienna, was carried unanimously: "That, opportunity having now been afforded for the first time to laryngology to show its capabilities at an International Medical Congress, and its place amongst the recognized specialities being now fully secured, a repetition of isolated Laryngological Congresses is the less required; and that it is therefore desirable to abandon the plan adopted at the first Laryngological Congress, held at Milan last year, of holding a second meeting next year at Paris."

At the conclusion of the proceedings votes of thanks to the Chairman and Secretaries were proposed and carried unanimously; that to the Chairman being proposed by Dr. Meyer, Copenhagen, and seconded by Dr. Solis Cohen, Philadelphia; and that to the Secretaries being proposed by Dr. B. Fränkel, Berlin, and seconded by Dr. Fournié, Paris.

Altogether 342 gentlemen inscribed their names as members of the Subsection; of these, as far as could be ascertained, 116 were Englishmen and 116 foreigners—viz., 35 Germans, 30 Americans, 15 Frenchmen, 13 Spaniards and South Americans, 7 Belgians, 6 Russians and Poles, 6 Italians, and 4 Austrians. Of the remaining 110, whose nationality, in most instances, could not be ascertained, some belonged to other nations, the greater part, however, no doubt, to England and America. The number of those simultaneously present averaged from 60 to 100. Of the papers sent in 38 were accepted, 20 of which were introductory papers, the gentlemen who read them having been invited by the Committee; 10 were contributions dealing with subjects suggested for discussion by the officers of the Subsection; 8 were papers on independent subjects. Of these 38 papers, 31 were actually read and 7 taken as read in the absence of the authors. The number of speeches made amounted to 126, which would allow an average of 8½ minutes to each speech, taking the whole speaking time at 18 hours. Of these speeches (which include the introductory and independent papers) 60 were made in the German, 53 in the English, and 13 in the French language. The total number of speakers who took part in the discussion was 50.

DISEASES OF THE EAR.

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INAUGURAL ADDRESS,

BY THE PRESIDENT,

WILLIAM B. DALBY, Esq.

THE gratification which is felt by all branches of our profession in this country, in having the pleasure of meeting our foreign confrères has been expressed so completely in the eloquent address delivered by the President of this Congress, that I should be going beyond my duties if I did more than offer the very sincere thanks of the aural surgeons in London to those who have done us the honour of attending this Section.

Perhaps in no department of medicine or surgery is it more desirable that those who are practising it should have the opportunity of meeting and comparing their views, than in that of otology, and this for the reason that from two very distant parts of the globe—viz., Germany and America, most of the recent researches in the scientific part, and many of the advances in the practical portion of this speciality, may be said to have arisen.

It is most fitting, therefore, that London, being in a measure mid-way between these two countries, should be the privileged ground of a debate, which, I trust will be an advantage, and cannot fail to be a pleasure, to the representatives of aural surgery in Europe and America who are here to-day.

In comparison with some other Sections, the subjects selected for discussion at first sight, perhaps, appear to be very few, but this arrangement has not been decided upon without due consideration, and with a very distinct purpose.

The pathology of certain diseases of the ear may be said to be established, and their successful treatment is without doubt conducted by all of us upon very much the same routine.

There are others upon the pathology of which very different views are held, and in

regard to whose treatment the most various methods are now advocated and practised. When I say that, amongst the latter class, especial prominence should be given to the so-termed proliferous catarrh of the tympanum, its treatment generally, and the several operations which have been devised and practised for its relief, I feel sure that this statement will receive general assent.

I regard, therefore, the present occasion as affording a most unusually favourable opportunity for a thorough discussion upon all points connected with this matter, and the first subject upon the programme—viz., "The value of operations in which the tympanic membrane is incised," includes all the debateable ground in connection with it.

Patients with this affection (certainly one of the most common diseases of the ear) are every day coming under the observation of aural surgeons, and it must be acknowledged that from the capitals of Europe and from the United States, the views and practice of most eminent authorities, whether as regards general treatment or operative proceedings, are of the most different character, and often opposed to one another even in principle. This extreme divergence of opinion is of itself enough to indicate the difficulties which surround the subject.

I may perhaps be allowed to say that the position which operations upon the tympanic membrane occupies in surgery at the present time is of a somewhat uncertain and indefinite nature.

It is well known that many surgeons never make an incision into the membrane: that others in their practice strictly limit this procedure to those cases of acute inflammation of the tympanum, in which there is tolerably conclusive evidence of the existence of pus. A third division, and this includes a very large proportion of those who attend to ear affections, make use of an incision, not only for the evacuation of pus, but also of mucus in a more or less fluid state from the tympanic cavity. In the fourth division must be placed those who, to the indications already named, add, as requiring one of the several forms of operation on the membrane, cases in which the tympanum has been the seat either of proliferous catarrh, or of inflammation which has left the membrane connected to the ossicles, or the wall of the tympanum by adhesions. Lastly, we come to the division of the tensor tympani muscle—without expressing any opinion on this subject, it may be said that, for whatever class of cases it may be practised, it can hardly be declared to take rank amongst those operations in surgery as one which, in consequence of its results, has received the recognition that is (and must be) accorded to every surgical proceeding worthy of universal adoption. It cannot, for example, in the present state of its history, bear comparison with a somewhat analogous operation in the department of ophthalmology—viz., iridectomy; and whatever position it may eventually occupy, it would be hardly too venturesome to predict for it a similarly brilliant future, if the anticipations which were formed by those who introduced and practised it had been even in a measure realized. What is the precise place which it holds at present, in the opinion of those well qualified to judge of its merits, we shall hope to hear before this Section has concluded its discussions. We may, I think, fairly presume that the object which is sought to be attained, from all operations which include incision of the membrane, is of a two-fold character—viz., the evacuation of the products of inflammation, or the relief of tension, and there are probably no surgeons of experience amongst us who have not, at some time during their career, performed various operations with these principles in view. If a general expression of opinion on the respective merits and demerits of each and every operation on the membrane is extracted at this meeting, such as may serve as a guide to those members of our profession who are devoting their energies to the study of diseases of the ear; the interests of surgery will have been well served, and I sincerely trust that this may be the result of our deliberations.

The next subject for discussion "Morbid growths within the Ear," not only includes the origin, nature and treatment of bony enlargements and exostoses in the external meatus, of polypus from whatever part arising, of myxoma, sarcoma and cancer; but also the treatment of perforations of the membrane, inasmuch as this is a very constant accompaniment and exciting cause of these growths.

Probably no portion of the body so well as the ear could be selected to illustrate the doctrine in pathology which teaches us that a local irritation must precede a homologous or heterologous formation. To take the last-named examples of myxomatous, sarcomatous, and cancerous growths. Certainly in none of the cases which I have myself seen, altogether three in number, or which within my knowledge have been recorded by other observers, has malignant growth affected the ear, unless it has been preceded for a considerable period by a purulent discharge secreted from the lining membrane of the tympanic cavity. The same rule held good in the only case in which I met with a round-celled sarcoma in the ear. A similar law will, I think, be always found to obtain when myxomatous tumours are found in this position—we all know how very generally every form of polypus is but the sequence of a perforation, and even when a polypus takes its origin from the external canal, a local irritation, represented by a circumscribed inflammation, which involves the periosteum of the canal, has existed previously. In the case, too, of multiple bony enlargements of the canal, although very often it is not easy to point to a local irritation, the history of a perforation of many years' standing may not unfrequently be extracted from the patient, so that it is fair to infer that the passage of a purulent discharge over the surface of the canal has been the direct cause of the so-called exostosis. In order to show the extreme probability of the truth of this explanation, we must fall back upon our personal experiences of cases—on five occasions I have attended patients with perforation of the membrane, who have been dismissed, and have presented themselves between two and three years later with multiple enlargements of bone almost completely blocking up the canal—another point, which also bears out the theory of a local cause to these growths, is one which I have constantly observed (and it has been recorded by others). It is that, when the enlargements are found in both canals, the patients have been much addicted to sea-bathing.

The third subject on the list, "the loss of hearing where the external and middle ears are healthy," embraces a very large proportion of the conditions under which the hearing s defective, whilst it is at the same time associated with subjective nervous symptoms. In this category will come syphilitic disease (inherited and constitutional) of the nervous structures, that very large class of cases to which for want of a better name, and apparently for no other reason, the term Ménière's disease has been applied; a subdivision of this class, in the contemplation of which no one, who has had a large experience of ear diseases, can fail to be struck with the intimate relation which exists between the auditory and pneumogastric nerves; cases of extreme deafness and perfect hearing alternating, without any explainable reason so far as an examination can detect. Those instances in which a permanent or temporary loss of hearing is without doubt primarily due to emotional influences, form a most interesting and distinct group in themselves. This is not an occasion on which I would venture to occupy your time by the relation of cases, but I may be allowed to mention by way of illustration that I have known the hearing in apparently healthy subjects to be almost completely lost on the witnessing a sudden death of a near relative, on several occasions immediately upon the receipt of news of a painful nature: in the case of women upon the fright produced by a cry of fire, or an alarm of burglars in the house; at the witnessing of the terrible sight of a man cutting his throat: once on the receipt of great good fortune which had not been anticipated. On each of these occasions the hearing power of the patient was always perfectly good

up to the time of the catastrophe, and immediately afterwards the deafness was intense, so that the change in all probability was almost instantaneous. In passing, I suggest as a possible, though imperfect and incomplete explanation, that in the cases referred to, a sudden hyperæmia in some portion of the brain, or perhaps in the medulla at the origin of the auditory nerve, may account for a phenomenon which we are not at present in a position to explain. In truth, because we cannot actually define the lesion or even its position, it is none the less certain that a local origin must exist. We have also to consider the unmanageable subject, and too often unmanageable symptom of tinnitus: the sudden and total loss of hearing consequent upon mumps, diphtheria, and some other acute diseases: the loss of certain ranges of notes whilst other sounds are normally heard. The list might be readily extended, but it is only necessary to mention what I have done to show that there is no dearth of material for our deliberations.

In many nervous diseases which come under the observation of physicians, a certain train of symptoms are met with, at the same time the actual lesion, or sometimes even the position of the lesion, is uncertain. The diseases are, however, quite familiar to us all, and we apply the same name to them. Amongst aural surgeons I am sure that mental notes are often taken, by the help of which, if they received expression, the nervous diseases of the auditory apparatus would be sorted into groups, nameless perhaps, but none the less suggestive of the probable termination of the cases, and rich in facts that might serve as a guide to future observers. That such notes, derived from the experiences of years, may be laid before us when the third selected subject is under discussion, I have great hopes. I purposely forbear to refer to any of the eminent men whose names are connected with the various diseases I have mentioned by suggested treatment; by the operations which they have introduced; by their valuable investigations and observations. They are perfectly familiar to all the members of this Section, and it would be difficult as well as invidious to allude to any without mentioning the names of many of the distinguished visitors whom we have the good fortune to meet to-day.

Note sur une modification apportée à la myringodectomie dans l'otite scléreuse.

Dr. A. Paquet, Lille.

Parmi les maladies de l'oreille, l'une des plus variables dans la forme, le mode de développement, la marche et la curabilité, est la sclérose de la caisse du tympan. Cette affection revêt une allure insidieuse; depuis longtemps déjà elle a commencé à se développer, lorsque le malade s'aperçoit qu'il n'entend plus distinctement d'une oreille; certains mots lui échappent, et dans la crainte d'une surprise toujours désagréable, on le voit prêter une attention forcée, qui contraste avec ses habitudes antérieures. On constate alors presque toujours des lésions étendues et anciennes, contre lesquelles la thérapeutique ordinaire possède peu de ressources.

Toutefois, ces lésions diffèrent suivant les sujets, et présentent un certain nombre de variétés que l'on peut rapporter à deux formes principales: la forme exsudative ou *plastique*, et la forme scléreuse proprement dite, appelée aussi par quelques auteurs, *otite sèche*.

Dans la forme plastique ou exsudative, on reconnaît l'existence de pseudo-membranes plus ou moins épaisses, s'étendant comme des travées de la membrane tympanique aux diverses parties de la face interne de la caisse, englobant parfois les osselets dans une masse de tissu conjonctif de nouvelle formation, immobilisant

ainsi des parties séparées ou mobiles les unes sur les autres à l'état normal. Plus tard, en vertu de la puissance rétractile de ce tissu conjonctif nouveau, la membrane du tympan, paroi mobile de la caisse, se trouve attirée en dedans vers la paroi interne, et fixée dans cette nouvelle position par des adhérences plus ou moins étendues, plus ou moins denses, qui s'établissent définitivement; le muscle tenseur du marteau, dans un état continuel de relâchement, se raccourcit; son inaction entraîne l'atrophie de ses éléments constitutifs, et après un certain temps ce muscle et son tendon se trouvent atteints de raccourcissement permanent, ou rétraction.

D'autre part, l'exsudat plastique envahit les fenêtres, et en particulier la fenêtre ovale, et l'accumulation à ce niveau de couches fibroïdes nouvelles enclave l'étrier et l'immobilise. Les articulations des osselets ne sont pas épargnées, les dépôts plastiques s'accumulent autour d'elles; à la longue, ces dépôts se densifient, et les osselets se trouvent immobilisés par une sorte d'ankylose fibreuse.

Dans la seconde forme, dite scléreuse proprement dite ou otite sèche, l'exsudat plastique est très limité, parfois même il semble faire défaut, et toute la lésion paraît constituée par des productions osseuses ou des dépôts crétacés; il se fait de véritables hyperostoses des osselets, et des incrustations calcaires dans les membranes; il semblerait, dans ces cas, que l'hyperplasie conjonctive est moins active, et qu'au lieu d'aboutir à des pseudo-membranes plus ou moins épaisses qui établiraient des adhérences, elle se laisse pénétrer par des sels calcaires; tout en exagérant les dimensions des osselets qu'elle soude entre eux, elle devient le point de départ de calcification des membranes, notamment de celle de la fenêtre ovale, englobant ainsi l'étrier, et le soudant définitivement à la fenêtre par la production d'une ankylose vraie.

Il est assez fréquent de voir ces deux formes se combiner; dans ces cas les lésions sont disséminées, et revêtent un caractère mixte. Plus rarement la lésion n'existe que sur quelques points isolés de la caisse, et nous avons plusieurs fois constaté l'ankylose de l'étrier, alors que la membrane tympanique présentait des caractères à peu près normaux.

La surdité produite par l'otite scléreuse présente quelques traits particuliers; elle est constante, progressive, peu modifiable par les agents thérapeutiques et par l'insufflation de l'air dans la caisse; elle paraît être influencée d'une manière heureuse par l'ébranlement imprimé aux osselets, car les malades entendent mieux au milieu du bruit, et pendant qu'ils voyagent en voiture ou en chemin de fer. Les bourdonnements et les sifflements sont tellement fréquents, qu'ils font en quelque sorte partie constitutive du cortége des symptômes de la maladie.

On comprend aisément la gravité d'une pareille affection, dont la marche progressive est fatale, et le peu de succès des méthodes thérapeutiques dirigées contre elle. Les moyens ordinaires demeurant inefficaces, on a proposé, pour remédier en partie à la surdité et aux bourdonnements, la section de la membrane tympanique; cette opération ayant été pratiquée un grand nombre de fois avec des résultats variables, mérite de fixer toute l'attention des otologistes; c'est à ce titre que je crois utile de communiquer quelques-unes de mes observations, et de donner mon opinion sur une méthode thérapeutique que j'ai eu plusieurs fois l'occasion de mettre en usage.

J'ai décrit dans mon livre "Sur le Traitement Chirurgical des Maladies des Oreilles" (Paris, Octave Doin, 1879) les indications de l'opération, et j'ai parlé des procédés employés par Toynbee, Weber, Bonnafont, Voltolini, Simroch, Roosa, Pommeroy, Spencer, Gruber, Wreden, Miot, &c.; depuis lors, j'ai eu l'idée d'adopter un procédé

mixte, participant tout à la fois de la myringodectomie antérieure dans laquelle, à l'instar de Weber, on sectionne le tendon réfléchi du muscle tenseur du tympan, et de la myringodectomie postérieure pratiquée avec ou sans excision d'une portion de la membrane tympanique. Les succès que j'ai obtenus par l'emploi de ce procédé m'engagent à le faire connaître, et à le soumettre à l'appréciation des otologistes.

Je me sers d'un petit bistouri à manche coudé, dont la lame, large de 2 millimètres, et présentant une longueur de tranchant de 4 millimètres environ, est recourbée légèrement en forme de faucille; cet instrument se trouve dans toutes les trousses des médecins auristes. La première incision se fait de la manière suivante: je ponctionne la membrane tympanique à 1½ millimètre en avant de l'apophyse externe du marteau, puis je sectionne la membrane obliquement en bas et en arrière, de façon que l'extrémité inférieure de l'incision se trouve placée sur la demi-circonférence inférieure de la membrane, au point où aboutirait une ligne verticale menée de l'ombilic à la circonférence; cette première incision, faite par de légers mouvements de scie, sectionne non seulement la membrane, mais encore le tendon réfléchi du muscle tenseur du tympan, ou tout au moins la gaîne fibreuse du muscle, décrite par Toynbee sous le nom de ligament tenseur de la membrane du tympan. Je reporte ensuite le bistouri dans le segment postérieur de la membrane, au niveau de la poche postérieure de Troeltsch, à 2 millimètres en arrière du manche du marteau, et je pratique la seconde incision, laquelle, se dirigeant d'abord obliquement en bas et en arrière, parallèlement au manche du marteau, puis en bas et en avant, à partir de l'ombilic, vient aboutir sur la demi-circonférence inférieure de la membrane au point terminal de la première incision; de la sorte, je fais en résumé une incision composée en V, à base supérieure correspondant à une ligne horizontale passant par l'apophyse externe du marteau, et à sommet inférieur placé au niveau du pôle inférieur de la membrane tympanique; cette incision en V produit un lambeau de même forme, adhérant par la base, et dont la moitié supérieure renferme le manche du marteau.

Il est facile, ainsi que je l'ai fait deux fois, d'exciser la portion inférieure du lambeau, afin d'obtenir une perte de substance de la membrane qui rende la perforation durable.

Les opérations de Wreden et de Miot conduisent au même but, par des moyens différents; reste à savoir s'il faut leur donner la préférence ou si le procédé que je préconise ne présente pas certains avantages qui doivent en assurer l'emploi dans la pratique générale.

L'opération de Wreden se compose de deux temps, dont le premier consiste à former dans la membrane du tympan un lambeau quadrilatère, dont le bord inférieur libre, large de 3 à 4 millimètres, se trouve placée à 2 millimètres au dessous de l'extrémité libre du marteau. Je trouve à ce mode de confection du lambeau deux inconvénients: il est très difficile à exécuter parcequ'il demande une très grande habilité opératoire, et il nécessite la chloroformisation complète du malade; de plus, il laisse nécessairement un cul-de-sac à la partie inférieure de la caisse, ce qui peut entraîner des inconvénients dans les cas où l'on doit assurer l'écoulement d'un liquide, ou gêner la manœuvre des instruments destinés à détruire les adhérences.

Au contraire, le lambeau triangulaire à sommet inférieur situé sur la circonférence d'insertion de la membrane tympanique permet l'écoulement naturel des liquides contenus dans la caisse, et dans le cas d'otite sèche, laisse l'instrument destiné à détruire les synéchies libre d'agir dans tous les sens; enfin, ce procédé

constitue un mode opératoire qui est à la disposition de tous les praticiens, même de ceux qui ne possèdent pas une très grande habileté opératoire, ce qui n'est pas à dédaigner, dans l'intérêt général.

L'opération de Miot se pratique de la manière suivante : "Je coupe le tympan en rasant le bord postérieur du marteau dans ses deux tiers inférieurs et en prolongeant l'incision jusqu'à la partie correspondante inférieure du cadre osseux. A partir de l'angle supérieur de la plaie je coupe le tympan jusqu'à la partie postérieure correspondante du cadre osseux. J'ai ainsi un lambeau triangulaire adhérent seulement au cadre osseux ; il ne me reste plus qu'à le disséquer dans ces points et à l'enlever. Une fois la première incision faite, on peut faciliter la seconde incision en maintenant le lambeau avec la pince à griffes que j'ai fait fabriquer."*

Cette opération est assez facile à exécuter, mais elle me paraît passible de quelques-unes des objections que j'adresse à celle de Wreden ; ainsi, elle laisse un cul-de-sac à la partie inférieure de la caisse du tympan, et gêne la manœuvre du synéchotome. Elle ne permet pas non plus de sectionner le tendon réfléchi du muscle tenseur du tympan.

On peut d'ailleurs, sur mon lambeau, faire agir les sphyrotomes de Wreden, de Duplay ou de Miot, et réséquer le manche du marteau, ou se contenter de sectionner avec le bistouri coudé la partie inférieure du lambeau, afin d'obtenir une perforation durable, ainsi que le prouvent les observations qui font suite.

Bien que dans le procédé à lambeau triangulaire à base supérieure adhérente et à sommet inférieur libre, une grande partie de la longueur du segment antérieur de la membrane tympanique soit comprise dans la première incision, l'écoulement sanguin m'a semblé très restreint ; aussitôt l'opération pratiquée, ce qui se fait en quelques secondes, je fais pencher la tête du côté opéré, afin de faciliter le passage du sang dans le conduit auditif externe, et je l'entraîne au dehors, à l'aide d'injections légères d'eau savonneuse tiède, ou d'un pinceau à poils trempé dans le même liquide ; puis, je termine par l'instillation de quelques gouttes du mélange suivant : glycérine 30 parties, borax et hydrate de chloral ana 1 partie, laudanum de Sydenham 2 parties. Cette instillation est répétée toutes les trois heures, et le méat fermé par un petit tampon d'ouate de coton.

Pendant les premiers jours qui suivent l'opération, je pratique l'insufflation d'air par la trompe en me servant de la poire de Politzer avec très faible pression ; ces insufflations sont peu douloureuses, et ne semblent produire qu'un léger sentiment de brûlure dans le fond de l'oreille.

Mes opérés n'ont pas été endormis, mais la tête était solidement fixée par un aide, afin d'éviter tout mouvement. La douleur produite par les incisions paraît être très vive dans le cas où la membrane du tympan n'est pas profondément altérée dans sa structure, mais elle cède assez rapidement après l'opération.

Observations.

Observation I.—Otite plastique double avec tension anormale des deux tympans. Adhérences entre le tympan droit et la paroi interne de la caisse. Surdité presque complète. Myringotomie par le procédé à lambeau triangulaire à sommet inférieur, et résection de la partie inférieure du lambeau. Section des adhérences. Amélioration notable et persistante.

Madame A——, âgée de 38 ans, bien réglée et ayant eu cinq enfants, devient sourde de l'oreille droite depuis quatre ans, et de l'oreille gauche depuis deux ans.

* Miot, "Traité des Maladies des Oreilles," p. 271.

La surdité s'est montrée progressive depuis la troisième grossesse. Antécédents rhumatismaux dans la famille; la malade a eu à l'âge de 26 ans un rhumatisme articulaire généralisé; elle est atteinte de pharyngite granuleuse. Elle est de plus sujette à des vertiges qui redoublent dans l'intervalle des règles, pour cesser complètement pendant la période menstruelle, et 6 à 8 jours après, ainsi que pendant toute la durée des grossesses.

Examen des oreilles.—1°. Oreilles externes: rien de particulier à noter. Pas de cérumen.

2°. Oreilles internes: A. Montre: crâne. O. D. passable; O. G. assez bien. B. Diapason sur le vertex: mieux perçu quand les oreilles sont fermées, et mieux à droite qu'à gauche. L'otoscope à trois branches donne les mêmes résultats. C. Acuité auditive: O. D. rien au contact de la montre; O. G. très faiblement au contact. La voix moyenne n'est perçue qu'à gauche, et à une distance de 10 centimètres; à droite, il faut crier très fort, et contre l'oreille; la malade entend un peu mieux quand elle voyage en chemin de fer. Bourdonnements intermittents, à forme de roulements et de sifflements, ou de battements isochrones à ceux du pouls, se reproduisant la nuit dès que la malade se réveille, et diminuant pendant les règles; ont considérablement diminué pendant les dernières grossesses; augmentant par les temps humides, et quand la malade passe de l'air extérieur dans un milieu chaud. Tout travail intellectuel est rendu impossible par l'apparition immédiate et la persistance des bourdonnements.

3°. Oreilles moyennes; Tympans très concaves, opaques, peu sensibles à la pression du stylet; le manche du marteau est comme voilé, et vu en raccourci; l'apophyse externe est saillante. Le tympan droit paraît plus épais, et présente à la partie postérieure plusieurs points lumineux trés petits; le reflet lumineux normal fait défaut.

L'insufflation d'air dans les caisses produit un souffle rude; l'audition n'est guère améliorée, mais les bourdonnements disparaissent momentanément, surtout à gauche.

Traitement.—10 Novembre, 1879.—Pulvérisations pharyngiennes avec l'eau d'Enghien, et injections nasales avec le siphon de Weber. Insufflation de vapeurs iodées dans les caisses, chaque deux jours. 20 Décembre. Même état; je pratique sur le tympan droit l'incision en V de manière à tailler le lambeau triangulaire, ainsi que je l'ai décrit plus haut. Après avoir laissé reposer la malade pendant une demi-heure et bien nettoyé le conduit auditif, j'insuffle de l'air par la trompe droite: le lambeau triangulaire demeure à peu près immobile; je glisse alors par la branche antérieure de l'incision un petit bistouri courbé sur le plat, pour sectionner les adhérences; à un nouvel examen, je constate que l'air insufflé par la trompe fait flotter le lambeau; j'excise la partie inférieure du lambeau, immédiatement au dessous de la spatule du marteau; la malade entend la montre à 10 centimètres, et la voix moyenne à 1 mètre 50. J'instille quelques gouttes de la solution de borax et chloral dans la glycérine (voir plus haut).

21 Décembre.—Réaction assez intense; fièvre, température 39° Centigrade. Sensation de brûlure dans le fond de l'oreille. Purgatif salin; continuation des insufflations d'air à faible pression, et des instillations dans le conduit auditif. Vésicatoire volant à la région mastoïdienne.

23 Décembre.—Amélioration des symptômes locaux, cessation de la fièvre; persistance du bon résultat au point de vue de l'audition.

24 Décembre.—Suppuration assez abondante; même traitement, plus des bains locaux avec décoction de pavot tiède, chaque trois heures.

Les jours suivants, la suppuration va en diminuant; elle a cessé le 14 Janvier, 1880 : la perforation se maintient béante, et l'audition demeure aussi bonne qu'après l'opération.

Les bourdonnements persistant à gauche, la malade réclame la perforation du tympan gauche, espérant obtenir de ce côté la même amélioration qu'à droite. Je l'opère par le même procédé, mais sans réséquer la partie inférieure du lambeau; immédiatement, cessation des bourdonnements, audition de la montre à 15 centimètres, et de la voix moyenne à plus de deux mètres. Phénomènes consécutifs très simples, réaction inflammatoire des plus modérées, les lèvres des incisions sont un peu rouges et tuméfiées le lendemain et le surlendemain; le 26 Janvier la perforation est cicatrisée.

Trois mois après—le 29 Avril, 1880—je constate l'état suivant : la perforation droite reste béante, et l'amélioration survenue de ce côté persiste en totalité. Le tympan gauche est à peu près normal; on remarque seulement de chaque côté du manche du marteau deux petites traînées obliques, légèrement blanchâtres, indices des incisions. Les bourdonnements ne se montraient plus qu'à gauche, et à de rares intervalles, et principalement lorsque la malade quitte les petits tampons d'ouate qu'elle porte habituellement dans chaque oreille.

Observation II.—Otite scléreuse double, plus prononcée à droite—à gauche, combinée avec un catarrhe de la trompe et de la caisse. Myringodectomie à droite, par l'incision en V à sommet inférieur. Grande amélioration persistant un an après.

M. L——, percepteur des finances, 42 ans, goutteux, atteint de granulations pharyngiennes, et de catarrhe naso-pharyngien léger, a vu sa surdité commencer il y a deux ans par l'oreille droite; des bourdonnements alternant avec des bruissements ont apparu en même temps que la dysécie. Depuis huit mois, l'oreille gauche se prend à son tour.

Examen otoscopique.—1°. Oreilles externes : quelques lamelles épidermiques; diminution de la sécrétion du cérumen.

2°. Oreilles internes : A. montre : crâne; O. D. passable; O. G. assez bien. B. Diapason sur le vertex : mieux perçu à droite. Résultats peu marqués avec l'otoscope à trois branches. C. Acuité auditive : O. D. presque rien au contact de la montre; O. G. bruit perçu à 5 centimètres. La voix moyenne n'est pas entendue au contact de l'oreille droite; elle est perçue à gauche à 50 centimètres. Les bourdonnements sont beaucoup plus marqués à droite, où ils sont continus, qu'à gauche, où on les trouve intermittents, et plus prononcés lors des rhumes, qui sont assez fréquents. L'insufflation d'air les modifie à gauche, et ne produit aucun résultat à droite.

3°. Oreilles moyennes : O. D. : tympan très concave, terne, d'un gris sale, avec points d'un jaune osseux, notamment dans le segment postérieur. Apophyse externe très saillante, manche du marteau vu en raccourci, incliné en dedans et un peu en haut. L'insufflation d'air produit un souffle rude dans la caisse, et ne fait pas bomber le tympan en dehors. O. G. : Mêmes phénomènes, sauf un peu de vascularité le long du manche du marteau; l'insufflation produit quelques gargouillements dus à un léger catarrhe lié à un rhume qui existe depuis huit jours.

Traitement.—12 Février, 1880.—Régime anti-goutteux—insufflations par les trompes; grande amélioration à gauche : rien à droite.

28 Février.—J'incise le tympan droit en avant et en arrière du marteau, de manière à former un lambeau triangulaire à base adhérente et à sommet inférieur libre, situé sur la circonférence d'insertion de la membrane du tympan, au point

d'intersection de la normale abaissée de la spatule du marteau. Douleur très vive, surtout à la première incision; écoulement de sang, se prolongeant pendant quelques minutes. Le malade est mis au repos pendant trois-quarts d'heure, puis le conduit auditif est nettoyé avec un pinceau et de l'eau alcaline tiède; l'insufflation par la trompe fait flotter le lambeau; pendant cette insufflation, le malade accuse une sensation de brûlure vive dans le fond de l'oreille. Disparition complète des bourdonnements; voix moyenne entendue à plus d'un mètre: montre à 5 centimètres. Pansement à la glycérine additionnée de borax, chloral, et laudanum (voir plus haut). Pendant six jours, insufflation quotidienne d'air par les trompes; la sensation de brûlure disparaît.

7 Mars.—Les incisions sont cicatrisées; la membrane est injectée, surtout de chaque côté du manche du marteau. Pendant l'insufflation, on voit la membrane bomber un peu en dehors; le manche du marteau a repris la direction normale.

7 Avril.—Les résultats obtenus se maintiennent; l'oreille non-opérée s'améliore, ainsi que le catarrhe naso-pharyngien.

2 Février, 1881.—M. L——, opéré depuis un an, a conservé la plus grande partie de l'amélioration due à l'opération; sur ma recommandation, il emploie chaque jour le procédé de Politzer; il se considère très heureux de pouvoir continuer à remplir ses fonctions, alors qu'il y a un an il était sur le point de donner sa démission à cause de la marche rapide de la surdité.

Observation III.—Otite plastique double. Epaississement des membranes. Adhérences de la caisse. Myringodectomie par le procédé à lambeau triangulaire à base supérieure adhérente. Amélioration durable.

Léon M——, 18 ans, lymphatique; a eu dans l'enfance, des engorgements ganglionnaires multiples et une otorrhée double à l'âge de 4 ans. Depuis deux ans, il devient sourd au point d'avoir dû interrompre ses classes il y a huit mois. Rhinites fréquentes: angines catarrhales à répétition, bien qu'il ait eu les amygdales enlevées par mon père en 1868.

Examen otoscopique.—1°. Oreilles externes: conduits libres, peu de cérumen; léger rétrécissement des conduits (disposition héréditaire).

2°. Oreilles internes; A. montre: crâne, O. D. rien; O. G. presque rien. B. Diapason sur le vertex: mieux perçu à droite. C. Acuité auditive. O. D. rien à la montre; O. G. un peu, au contact. La voix moyenne est perçue à gauche à 15 centimètres, à droite au contact. Bourdonnements continuels en sifflements, avec bruissements par les temps humides.

3°. Oreilles moyennes: tympans gris-bleuâtres, ternes, très convexes; apophyses externes en saillie, mais comme voilées; manche du marteau peu apparent, vu en raccourci; aucune mobilité des tympans pendant l'insufflation.

Traitement.—9 Juin, 1880. Traitement général anti-scrofuleux. Insufflation d'air et injections dans les caisses avec de l'eau de goudron; insufflations de vapeurs iodées: résultats presque nuls.

24 Juin.—Myringodectomie à lambeau triangulaire à sommet inférieur libre; le malade, bien décidé, veut être opéré le même jour des deux côtés. Douleur modérée, écoulement sanguin très restreint. Après une demi-heure de repos, insufflation d'air; peu de mobilité des lambeaux; résection de la portion des lambeaux située sous l'extrémité du manche du marteau. Pansement à la glycérine boratée, avec chloral et laudanum.

25 Juin.—Peu de réaction à gauche; réaction intense à droite; sensation de brûlure et de tension au fond du conduit; fièvre, température 39°. Deux sangsues de chaque côté, l'une au tragus, l'autre à l'apophyse mastoïde; bains d'oreilles avec décoction de guimauve et de pavot; aconitine.

27 Juin.—Cessation de l'état fébrile; écoulement séro-purulent, plus prononcé à droite.

30 Juin.—Cessation de l'écoulement; les membranes tympaniques sont fortement congestionnées; les perforations sont béantes, à lèvres tuméfiées.

5 Juillet.—Cessation des phénomènes inflammatoires; la montre est entendue à 7 centimètres à gauche, à 4 centimètres à droite; la voix moyenne est perçue à 2 mètres 50, plus de bourdonnements.

2 Février 1881.—Depuis huit mois, les perforations se sont rétrécies, la droite à la dimension d'une tête d'épingle, la gauche est presqu' oblitérée; l'amélioration est à peu de chose près ce qu'elle était quinze jours après l'opération.

DISCUSSION.

Dr. Guye, Amsterdam: I consider that the cases in which the operation has been performed by me could be divided into four classes—viz.: 1. Cases of acute inflammation of the cavity, with redness of the membrane, serous, or sanguinolent exudation, and generally intense pain. 2. The sub-acute or chronic catarrh of the tympanum with mucous exudation, which may be very consistent. 3. The cases of old catarrh of the tympanum, with grave lesions in the internal ear, deafness, tinnitus, vertigo. 4. Paradoxical cases of inflammation of the tympanum, of which the characteristic symptoms were, a very acute inflammation of the cavity, with great pain and fever, and without any swelling of the Eustachian tube. This swelling of the Eustachian tube, which acts an important part in the etiology of inflammation of the middle ear, plays another critical part in so far as it produces an accumulation of the secreted fluid in the cavity, and in that way a perforation of the membrane. In the first class are those cases where we meet with a chronic catarrh of the nose or pharynx, and in which, by the influence of some external or internal cause, an acute inflammation is produced. Amongst the external causes that which occupies the first place is cold, whether produced by the introduction of cold water into the auditory canal, or by a current of cold air. Amongst the internal causes are ranged the constitutional ones, such as paludal, febrile, syphilitic, &c. What is the value of the incision of the membrane in these cases? By incision in cases of simple acute inflammation we follow the natural march, that is to say, the normal one. In the most simple cases, as in children, we see the pain is endured for a few hours, and then a spontaneous perforation takes place, from which a serous, or sanguinolent, discharge escapes, the pain ceases, and, in the majority of cases, if there be no inveterate catarrh of the nares and pharynx, nature effects in a few days a spontaneous healing. At a more advanced age the membrane is more resistant, and is able to bear the strain for a few days, or even till the acute attack has passed, without perforation or discharge. When, in such cases, we perform myringodectomy, we obey a natural indication by doing what nature would do in a short time for herself. When, from some unknown reason, the membrane resists rupture for a considerable time, a spontaneous perforation is followed by a great loss of tissue, and therefore a corresponding difficulty in cicatrization. By surgical interference we cut short the process, and save much time and agony. In such simple inflammations, I have obtained a more rapid and more complete recovery than in those allowed to form a natural opening. In cases due to scarlet fever or syphilis, although I think local treatment important, I am of opinion that in a great number of cases it is not required. In regard to typhoid fever, I cannot place it in the same category. In cases of typhus, complicated

with disorders of the ear, there are some in which no perforation is to be found, and others in which, after typhus is over, perforation and purulent discharges are found, the diagnosis of the ear affection having been obscured by the grave typhoid symptoms. In the second class of cases I place the sub-acute, or chronic catarrhal, with consistent mucous—cases well known to all aurists. When we see the masses of viscid mucus which are sometimes removed by incision and injection, followed by rapid cicatrization of the membrane and splendid results to the hearing, we can have no doubt of the benefit of the operation. The diagnosis in these cases is not always simple, and incisions are frequently made without finding the mucus expected. Fortunately, there is no great damage done. Such a case brings us to the next class, in which the results, although of no great benefit, are not to be despised. Third class: This embraces those numerous chronic cases, in which the affections of the internal ear predominate, and the local treatment consists chiefly of the injection of vapours or liquids through the Eustachian tube with the view of accelerating the circulation, nutrition, and reabsorption, so as to act in this way indirectly on the internal ear. In this class of cases the incision of the membrane is very useful. The perforation allows of the passage through the cavity of liquids and vapours with a more complete and satisfactory result. By this means we may maintain a discharge from the cavity for a considerable time—a discharge acting beneficially in the internal ear. I have repeatedly performed the operation in this class of cases several times—once ten times—in the same membrane. Some of the best results in this class have been obtained in cases of chronic catarrh consecutive to typhus fever, where the tinnitus is so distressing. The fourth class is formed by two paradoxical cases. The first was that of a workman suffering from great pain in the ear, with muco-purulent naso-pharyngeal catarrh, but without discharge from, or perforation of, the membrane. The Eustachian tube was very patent, and this was, I thought, the reason for the non-perforation of the membrane. The swelling of the Eustachian tube, usually seen with inflammation of the cavity, and which often plays an etiological *rôle* in the development of the inflammation of the cavity may also play a salutary one, in that it allows of the accumulation in the cavity, which exerts a pressure, and perhaps a solvent action, on the membrane, and so accelerates the perforation of it. The easy discharge of the accumulation through the tube is generally a favourable circumstance in mild cases; but in more acute inflammations, where perforation of the membrane is the natural result, it becomes a dangerous circumstance, as it prevents the perforation taking place. In this case, paracentesis was performed, and the treatment of the whole mucous membrane carried out for some time with the most satisfactory result. The second paradoxical case was somewhat analogous to that just given. I was asked to see a lady suffering from acute earache. I found the membrane slightly red, the Eustachian tube well opened by Valsalva's method. Politzer's method and the use of the catheter were of no benefit. There were no carious teeth to which I could ascribe the affection. A V-shaped incision was made, and carbolized solutions injected, with results which, in a few hours, were most gratifying. In this, as in the preceding case, the patient could blow through the perforation immediately after the incision was made. There was little redness of the membrane, no discharge, no inflammatory swelling of the Eustachian tube. The indications for the operation were by no means precise, and yet the results were beneficial. The after-treatment, of course, varies with the nature of the case. One point on which I lay much stress is, that we must guard the operated ear from cold, as I have repeatedly seen serious consequences therefrom.

Professsor VOLTOLINI, Breslau: The maintenance of a permanent opening in the membrana tympani is to me as yet an unsolved problem. When a foreign body is present behind the membrane it is necessary to perform the operation to remove it. The most frequent cause requiring the operation is when exudation is present in the cavity, either as mucus, serum, or pus. To determine the diagnosis of such exudations in the cavity, I find sunlight the most convenient light, which I convey into the ear by means of a modified Brunton's speculum. By this modification I also introduce the knife by which the paracentesis is made. In certain cases in which a polypus has foreed its way through the membrane, I have found it necessary to incise the membrane in order to arrive at the root, and act upon it by the galvano-caustic.

Dr. LOEWENBERG, Paris: May I ask Professor Paquet for precise indications for this operation? I am at a loss to understand how this operation can produce a permanent opening when all other operations have failed in doing so. Does suppuration follow the operation? I am somewhat astonished at not having heard mentioned one of the most important classes of cases in which paracentesis is useful, in the enlarging of an opening in adenoid disease to free the mastoid cavity.

Dr. GELLÉ, Paris: Will Professor Paquet explain the permanence of the opening? I have performed the multiple section with a triangular incision of the membrane for many years, without having been able to maintain a permanent opening. I should think there would be difficulty in forming the flap proposed.

Professor PAQUET, Lille: In answer to MM. Löwenberg et Gellé, I may state that there are two principal indications for using myringodectomy—viz., the removal of exudations, and the formation of a permanent opening. The latter is not to be obtained by incisions, but by excisions of as large portions as the operator can obtain. The cavity of the tympanum in its normal state is highly vascular; but in the cases of sclerosis of the cavity, the vascularity of the membrane is much diminished, and, therefore, the probability of inflammation following the operation is less likely, and the chance of the filling up of the perforation decreased.

Dr. THOMAS BARR, Glasgow: I have practised incision of the tympanic membrane in two classes of cases: 1st, when there was purulent, mucous, or serous exudation in the cavity of the tympanum, or in the interstices of the tympanic membrane; and, 2nd, in cases of chronic simple catarrh, with no fluid exudation, and in which tinnitus was a prominent symptom. The propriety of the operation in the former class of cases cannot be gainsaid, as it is based on ordinary surgical principles. In acute purulent collection in the middle ear where the tympanic membrane has become thickened and more unyielding, in consequence of previous disease, the operation is eminently called for. In such a case timely incision of the membrane may prevent the extension of the disease to the labyrinth, or to the meninges. In mucous or serous exudations in the middle ear the operation is indicated, first, where the quantity is so great as to cause a distinct saccular bulging of the membrane, especially at its posterior part, a condition not unfrequently met with in children; second, when the mucus is thick and viscid, although not in such quantity as to produce distinct bulging. Here the operation, timely performed, may avert important and permanent structural changes in the tympanum.

My experience of cutting operations in the tympanic membrane, when no fluid exudation exists, has not convinced me of their value. I have at times observed more or less transient improvement in the hearing or in the tinnitus, but my good results have not been at all notable. In these cases of dry catarrhs I usually injected, after performing the incision, a weak alkaline or other stimulating fluid through the Eustachian tube into the cavity of the tympanum, and that the fluid did reach the tympanum, I had ocular proof on examining the seat of the incision immediately after the injection. On the whole, experience seems to show that the operation of incising the membrane is of value, mainly in cases of fluid exudations in the middle ear.

Dr. PIERCE, Manchester: With regard to Dr. Paquet's V-shaped incision of the membrana tympani, including that of the tensor tympani, it may be very advantageous so far as the durability of the perforation is concerned. As to its value in sclerosis, it does not affect the disease which constitutes sclerosis—viz., permanent thickening of the entire mucous membrane of the tympanum. As to the value of Dr. Paquet's operation for the evacuation of fluids in the tympanic cavity, it does not offer any advantage over the ordinary incision in front of or behind the manubrium. I hope my experience of Dr. Paquet's operation may prove its advantage as a means of obtaining a durable perforation.

Dr. URBAN PRITCHARD, London: There can be no difference of opinion as to the value of this operation, when there is fluid behind the membrana tympani. But in cases of sclerosis is it worth while running the risk of further injury to the middle ear, for the chance of improving the hearing power in those few cases where a permanent opening is beneficial, even supposing this permanence be obtainable?

Dr. CASSELLS, Glasgow: I have never performed the operation of tenotomy of the tensor tympani, because in all my experience I have not seen a case of ear disease in which this operation could have been employed. From our distinguished confrère, Dr. Weber-Liel, I had this operation brought under my notice many years ago, and also, according to his opinion, the cases in which it could be used with success were sclerosis of the tissues of the tympanic cavity, with contraction of the tendon of the tensor tympani, accompanied with distressingly loud tinnitus. As to the incision of the membrana tympani itself, I have to say that I belong to the fourth class of aural surgeons mentioned in our President's opening address, *i.e.*, I use multiple incision of this structure when it is relaxed with the best effect: simple incision of it to sever mucous bands in the tympanic cavity, and other adhesions; also for enlarging a small perforation in the membrane, so as to bring about cicatrization, or to terminate a persistent ear-discharge. Also in serous catarrh of the tympanum, in acute muco-tympanitis, in cases of chronic and solid mucous accumulation in this cavity. I also perform it in exanthemal catarrh, acute or chronic, scarlatinial or rubeolar, and in malarial catarrh, and also in cases in which there is pent-up pus in the mastoid cells; also any other case in which this operation is indicated. I have rarely had to re-incise the membrane, more especially in children, for I perform this operation on very young infants, as also on children of a greater age, in whom the ears become affected during the progress of an attack of scarlatina, as soon as ever a slight injection of the tissues of the organs appears; in this way cutting short what might prove to be a serious ear disease. Therefore, were I asked my opinion of this operation, I would reply that it is the most

valuable one in the domain of aural surgery; and if I were asked further, by what means I had done the most good as an aural surgeon, I would reply, without hesitation, by incising the membrana tympani.

Dr. LOEWENBERG, Paris: I think that all aurists agree upon the necessity of opening the membrana tympani in order to let out pus, thus applying general surgical rules, which teach us that opening a collection of pus is preferable to allowing the natural breaking to take place. This operation, too, enables us immediately to prevent septic poisoning, which, in my opinion, is the important point, and not that of combating already existing germ infection.

Professor S. J. JONES, Chicago: In considering the question of the propriety of puncturing the membrana tympani, the object in making such punctures should be kept distinctly in view. First, if that object be to give exit to fluids confined within the middle ear, which endanger the integrity of the ear, and sometimes jeopardize life, the operation is not only justifiable but is demanded, as is now generally conceded. The incision substitutes a straight cut, for the more or less circular opening from spontaneous perforation, which usually results if the case be left alone, being accompanied by loss of tissue which makes recovery slower than in cases where the membrane has been incised. Second, if the object be to remove an accumulation of inspissated mucus from the tympanum, as was practised nearly a century ago and abandoned, and recently revived, such puncture is of, at least, questionable propriety, for removal of it can be effected without incision. Third, if the object be to secure a permanent opening in the membrana tympani, in the hope of improving hearing, or of relieving tinnitus, the results so far obtained do not seem to warrant frequent repetition of the operation, for it is difficult to make a permanent opening in the membrana tympani, artificially, the opening generally influences but slightly, if at all, the hearing power, and many of the causes of tinnitus still remain, even after opening both the membrana tympani and the Eustachian tube, and relieving rarefaction of air in the middle ear. Fourth, if the object in opening the membrana tympani be to get access to the middle ear for still further operative procedure within the tympanic cavity, such as division of the tensor tympani, there are doubts whether any operation for that purpose has yet divided the tensor tympani, or, if it have, whether permanent benefits has resulted. Even if the results of such operations were negative, objections to the operations exist, but when the anatomy of the parts is considered, how small the space is, and how deeply situated, in which the operations have to be performed, the probabilities of serious injury to the delicate structures of the middle ear, and possibly of the internal ear, raise a grave doubt as to whether incision of the membrana tympani, and subsequent operations within the tympanum are even justifiable. It is not a sufficient answer, that the cases seemed hopeless before, and that they could not be made worse by operation, for it is difficult to estimate the extent to which even such serious cases may be aggravated; and, besides that, it is not for such seemingly hopeless cases that these operations are proposed. From this, the natural conclusion is that the cases in which the best results may be expected from artificially opening the membrana tympani are those in which it is desirable to remove hypersecretion, as a result of acute inflammation, from the middle ear, especially if the membrana tympani has been thickened by prior disease; that opening that membrane for other reasons is usually of, at least, doubtful propriety; and that opening it, as a means of

gaining access to the cavity of the middle ear for further operative procedure therein, seems unjustifiable, in nearly all, if not in all, cases.

On the Ætiology of Aural Exostoses, and on their Removal by a New Operation.

Dr. James Patterson Cassells, Glasgow.

Historical.

In order that a clear idea of the whole subject of osseous tumours of the external auditory meatus may be formed, I will first of all quote the opinions of other aurists.

Dr. Erhard, of Berlin, says that it has not been satisfactorily proved that after the period of ossification of the membranous meatus exostoses and hyperostoses can develop in the bone in consequence of certain primary pathological irritations. The two external auditory meatuses varying more or less in structure in all individuals, it follows that a one-sided narrowing may easily mislead in this direction. It has also not yet been proved that syphilis exercises a specific influence in this respect. It is true that hyperostoses are met with in cases of obstinate otorrhœa, dating from early childhood, but I have never seen them develop at a more advanced age.

Prof. Seligmann, of Vienna, says that Europeans are less subject to these exostoses of the auditory canal than certain races of American Indians, because it is still the custom of the latter to elongate the cranium artifically. In six cases of Titicacas deformed in this way, he found five times the anomaly in question, but he did not find it in other American races, the Avares, for instance, whose craniums were deformed in exactly the same way.

Welcker says that he found these osseous excrescences also in North-American Indians, whose craniums were not deformed. That transatlantic races are more predisposed to this defect than Europeans he proves by the fact, that among all the skulls he examined, those of Europeans showed not a trace of it, although their number was by far the largest.

Triquet says that they are only observed in syphilitic persons, and that they are a tertiary manifestation of the disease.

Nélaton says that the only tumours, which can be called exostoses, are those which have originated through a partial abnormal expansion of the osseous tissue, or through osseous deposits in circumscribed places. He also remarks that the slow growth of these tumours seems to be in accordance with their density.

Schwartze believes that the term "spongy" or "compact" exostoses only expresses different phases in the development of the new formation; that, for instance, the spongy exostoses may become solid, and *vice versâ*. This opinion is shared by Virchow and Nélaton. Schwartze further says that this is the only case in ear disease where hereditary disposition may be accepted without reserve.

Von Tröltsch says that he has observed them almost always simultaneously in both meatuses. He also refers to the extreme sensibility of these tumours when touched with an instrument, while most of the other investigators go so far as to say that it is one of their peculiarities that they are insensible to touch, and can even be cut away without pain. He recommends Wild's écraseur for their removal.

Wilde has rarely seen them at the same time in both ears. He says that these exostoses originate from ostitis or periostitis, which opinion is shared by Rau. Wilde recommends local bleeding and the inward application of mercury.

Toynbee always found exostoses of the auditory meatus to be composed of a compact osseous tissue. He says that the abuse of alcoholic drinks is of influence upon the production of these tumours. This opinion is shared by Von Tröltsch. Toynbee considers them an outcome of a gouty or rheumatic diathesis. He recommends painting them with iodine, and has always painted them with a solution of nitrate of silver.

Bonnafont at first practised gradual lancing and gentle cauterization with nitrate of silver; later on, trepanning.

Heinicke, of Erlangen, removed the tumours by means of the gouge and mallet.

Clark, of Bristol, has obtained good results from electricity.

Delstanche fils, of Brussels, in his pamphlet on "Osseous Tumours" in the external meatus, comes to the conclusion that they may arise either before or after the period of ossification of the canal; that the causes are hereditary disposition, inflammation, or spontaneous or traumatic irritation of the bone or periosteum, either primary or secondary; that they may appear in any part of the osseous meatus, but they most frequently occur in the posterior portion; that medical treatment has seldom good results, but that surgical treatment may, in certain cases, bring about a complete cure.

Clarence J. Blake, Boston, measured 199 crania of the mound-builders of the Cumberland Valley, in Tennessee; the average diameters of the meatuses were:—vertical, 10·1 mm.; antero-posterior, 6·3 mm. In thirty-six of these, exostoses were found in one or both canals. In thirty the average diameters, without reference to the narrowing effected by the exostoses, were: vertical 10·3 mm.; antero-posterior, 5·7 mm., showing a more decided narrowing in cases of exostosis, being accounted for in part by a general thickening of the anterior and posterior walls of the canal. Measured also fifty-five Californian crania; average diameter of meatuses: vertical, 11·1 mm.; antero posterior 8·61 mm. Of 108 Californian crania superficially examined, five had exostosis in one or both canals; in three of the five there was a corresponding narrowing of the canal.

J. Barnard Davis found aural exostosis in a cranium from the Marquesas Islands, in one from the Loyalty Islands, in three Kanaka crania from the Sandwich Islands, in one belonging to the Khas tribe of Nepaul, in four Peruvian crania belonging to the Ouichua Indians, and in the skull of an ancient Roman.

Professor Turner, Edinburgh, found in an artificially deformed Peruvian cranium both meatuses almost entirely occluded by hard, ivory-like exostoses. In the right meatus there were two; the one pedunculated and pea-like in shape, almost blocking up the orifice; the other more elongated in shape, and attached to the anterior wall with a broad base. There were also two in the left meatus; one of the size of a small pea arose with a broadish base from the anterior wall, the other of the size of a small shot from the lower part of the posterior wall. The exostoses almost touched in the middle of the meatus, so that in the living person, when the integument was in place, the passage must have been quite blocked up. In both ears the exostoses grew from the wall formed by the auditory plate of the expanded tympanic ring. He also found exostoses in both ears of an adult skull of a flat-head Chenook Indian. These two craniums, as well as those observed by Professor Seligmann, were altered in shape by artificial compression, the zygoma and the parts around the meatus had, however, preserved their normal form,

While Professor Seligmann found exostoses in five out of six crania, Professor Turner only found them in the above-mentioned two, out of seventeen artificially deformed crania of North and South American Indians, examined by him. In at least three of these crania, where there were no exostoses, the shape of the auditory meatus was modified, the vertical diameter being markedly greater than the antero-posterior. He is, however, not prepared to ascribe this to artificial compression, as he has observed in several Peruvian skulls, which were not deformed, a similar anomaly of the meatus, the entrance into the right external meatus of one being narrowed into a vertical slit. It therefore appears to him that in American Indians a tendency for modification in the configuration of the external auditory passages exists.

The Author's views on this subject.

I regard all the difficulties that have hitherto surrounded the study and treatment of these tumours as arising, for the most part, from regarding all the bony tumours that are found in the external auditory meatus, as exostoses. The fact being, that in that canal we have tumours which are exostoses, and others that are hyperostoses with structures quite distinct from each other, the former being a new growth of tissue, while the latter is a hyperplasm.

The following conclusions, which appeared in the *British Medical Journal* of the 15th of December, 1877, in regard to the origin of aural exostoses, are the results of several years' observation.

Premising that aural exostoses and hyperostoses are totally distinct affections in regard to origin, structure, form, site and treatment, an aural exostosis is benign in origin, only to be found arising at the outer half of the external auditory meatus, and has its point of attachment nearly always at the posterior wall; is pedunculated and has its origin in the periosteum of the mastoid, close to the meatus.

The origin and development of an aural exostosis are as follows:—At the outset, a sub-periosteal abscess forms over the mastoid, and makes its way out and into the meatus by way of the line of least resistance, ordinarily coming out between the cartilaginous and osseous portions of the canal, sometimes even through the cartilage of the canal, discharging itself and continuing to do so for some time. By-and-by highly vascular, granular-like growths sprout from the opening of the abscess, and go on increasing in size, while, at the same time, they are being gradually changed into bony tissue in their interior, by the gradual conversion of their cells into bone cells.

The final size of the osseous tumour or exostosis, as well as its form, is determined by the original size and form of the granular-like growths. After complete ossification no further increase takes place in the size of the tumour.

Sometimes these granular growths seem to spring from around the lip of the orifice of the abscess, forming a little hollow cone, through the apex of which pus continues to escape freely for some time.

As to the treatment of these cases in their early stage, when the growth is still granular in character, their removal by Wilde's écraseur and the cauterization of the tiny canal of the abscess and its sac, with a probe coated with the nitrate of silver, generally suffices, if effectually done in the first place, to effect a complete cure without further treatment. When the tumour has become more solid, because of its gradual conversion into bone tissue, Wilde's écraseur, armed with a stout steel wire, may suffice to effect the removal of the tumour, if its pedicle be thin and deli-

cate; if, however, the pedicle be massive, and dense in structure, other measures are to be had recourse to, to which I shall presently refer.

In 1874, a young lady, fifteen years of age,* came to me, complaining of a hard body in her left ear; on examination I found that the body was whitish in colour, resistant in structure, globular in form, attached by a very short pedicle to the outer half of the posterior wall of the meatus. Supposing it to be an ordinary fibrous polypus, I used Wilde's écraseur and removed it; I found, however, that the pedicle was very resistant to the passage of the wire. On examination the pedicle was found to be composed in great part of bony tissue.

Fig. 9.

Polyp from External Auditory Meatus.

View of section of the whole polyp under a low power; the osseous pedicle at A; the thickened irregular covering of rete mucosum and epidermis at B and along the edge; at C the bony deposit can be seen penetrating into the tissue of the tumour and the cellular groups from the tumour continuous with the cell masses in the cancelli. The mass of the tumour is a fibrous network, enclosing groups of small cells.

Fig. 9 of the illustrations is a magnified section of the tumour.

Fig. 10 is the appearance represented by the pedicle.

Since then I have seen two or three cases in consultation, in which the removal of full-grown exostoses was objected to, on the ground that the risk of the operation counterbalanced its probable benefits; all these cases, I may say, could have been removed as easily as the one I am about to relate briefly.

* Seen in consultation with Dr. Wood Smith, of Glasgow.

I show you a water-colour drawing, taken by myself, of one of these cases, which occurred in the person of a celebrated university professor, who declined to have the tumours removed, although he was rendered almost totally deaf by their presence.

Fig. 10.

View of edge of osseous deposit in tumour (Fig. 9) near C, as seen under a power of 350 diam.: shows the cells of the tumour gradually becoming enclosed by calcareous deposit and being converted into bone cells (after decalcification by dilute nitric acid).

Fig. 11.

Section of Surface of a Polyp of the Ear almost entirely Ossified.

A. The osseous tissue decalcified with weak nitric acid.
B. The remaining coating of fibro-cellular tissue.
C. The covering of skin over the tumour with irregular papillæ.
Hartn. object. 6: eye-p. 4.

In 1878 I was consulted by a man, aged forty, who, eighteen years previously, had been discharged from the army for ear disease. When I saw him, a fibro-vascular tumour projected from the orifice of the meatus to the extent of half-an-inch, the

appearance of which is well represented by fig. 12. The removal of this tumour, which was followed by very profuse hæmorrhage, led to the discovery of an exostosis, nearly blocking up the lumen of the meatus near its outer orifice; a water-colour drawing, which I have here, gives a good representation of it before its removal, while fig. 13 shows its size after removal, and fig. 11 shows its microscopical structure.

The operation for its removal was as follows:—

A loop of wire was passed over the tumour to its base or pedicle, and twisted upon itself, so as to grasp the pedicle of the tumour firmly. The patient was now

Fig. 12.

Fibrous Polypus from Meatus.
Nat. size.

Fig. 13.

Aural Exostosis.
Nat. size.

chloroformed, and a sharp gouge, with a curve, carefully adjusted to that of the posterior and outer end of the auditory canal, was carried down to the base of the tumour, close to its union with the posterior wall of the canal.

While firmly held there the head of the chisel was struck three smart blows with a mallet, the separation from its attachment to the wall of the meatus was easily effected in this way, and its removal from the depths of the meatus, into which it had sunk, was as easily accomplished by the wire ligature, which had been attached to the tumour before the operation.

The patient recovered without a bad symptom, and was fit for work in about a week after the operation. When the case was last seen, there was no return of the growth.

As I believe that every aural exostosis may be removed as easily as this one was, I commend this new method of operating to the attention of my *confrères*.

NOTE.—The above illustrations are from sections made and drawn on wood by Dr. David Foulis, Pathologist to the Glasgow Royal Infirmary.

Conclusions derived from the foregoing.

The osseous tumours of the external meatus are of two kinds, the one, named hyperostosis, being a hyperplasm; the other, exostosis, being a new growth. These differ from each other in origin, size, shape, structure, and number. Hyperostosis is seen only in the inner or osseous end of the external auditory meatus; exostosis is found arising from a point near the junction of the osseous canal with its cartilaginous portion; hyperostosis is never seen till the osseous meatus is completely ossified; exostosis appears before the complete ossification of the meatus; hyperostosis is always conical in shape, never pedunculated. In exostosis, on the other hand, there is always a pedicle, and its shape varies; hyperostosis is of ivory hardness; exostosis, before complete ossification has taken place in the tumour, can be pierced to a varying depth; hyperostosis is not movable on pressure; exostosis is slightly movable, even when complete osssification has taken place; hyperostosis is often seen without any other disease of the ear, and if an ear-disease exists, there is no causative relation between them; they exist altogether independently, and apart from each other; exostosis is nearly always com-

plicated with another affection of the ear, past or present; hyperostosis, therefore, may exist in the meatus with normal hearing; exostosis, on the other hand, is almost always attended by a defect in the hearing. The deafness which accompanies hyperostosis, in the absence of any other disease of the ear, is due to the size of the growth, and is mostly mechanical, or it is due to the presence of debris between or behind the tumours. In exostosis the defect in hearing may also be mechanical; this defect, however, is generally due to ear disease, either past or present.

Operation for the removal of hyperostosis is only justifiable when its mechanical pressure has been ascertained to be the sole cause of the deafness, or when a coincident ear-discharge exists, the escape of which may be hindered or altogether arrested by the presence of the tumour. The commonest cause of deafness in uncomplicated hyperostosis is the presence of debris around the tumours, cerumen, epidermic masses or other matters, or to mechanical irritation and inflammation of the tissues that cover them. The hearing is mostly restored on the removal of the débris or inflammation. The operation for the removal of hyperostosis is best affected by a mechanical drill, such as dentists use; this is the safest method of removal.

For the operation of the removal of an exostosis, a gouge is the best instrument, because the tumour can be removed at one operation, whereas a hyperostosis usually demands several operations as well as separate sittings for its complete removal, when this is possible. There may be several hyperostoses in one ear, but there never is more than one exostosis. Both classes of tumour may exist together in the same ear.

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Morbid Growths of the Ear, and their Treatment, with Illustrative cases.

Dr. Laurence Turnbull, Philadelphia.

The tumours, or morbid growths, which are found in the ear, causing deafness either by direct pressure, or reflex action, are sebaceous, encysted, fibrous, fibro-cartilaginous, othæmatomata or angiomatous, epithelioma, sarcoma, chondro-sarcoma, and alveolar. The first variety are usually attached to the meatus by a small pedicle, consisting of the corium and epidermis, and are filled with white, slightly glistening, contents, consisting of cholesterine, epithelial cells, flat globules, and crystals of lime. Sebaceous tumours vary in size from a millet seed to a large hazel nut, having a firm enveloping membrane of connective tissue. Gruber figures and describes an atheroma of large size.* The structure of these tumours, or morbid growths, is of flattened cells, which are arranged in layers, proving to us that they are only masses of desquamative epithelium. We have seen numerous cases of them enlarging the meatus, perforating the membrana tympani, and finally perforating the bone, by a gradual atrophy from pressure of the mass. Osseous growths in the meatus, or auditory canal, are sometimes mistaken for tumours, being covered by the dermis. Pressure with the extremity of a probe is usually sufficient to determine the character of the growth within the ear. These growths of bone cause great narrowing of the meatus, and are often found with caries of the middle and internal ear; they are removed by means of the chisel and mallet, and the dental engine.

Treatment.—Removal of the encysted and sebaceous tumours by careful dissection of the epidermic layers by the use of the forceps and scoop, or by repeated syringing with a warm solution of borate of soda, or caustic potash. The whitened and altered condition of the tympanic membrane, which is caused by the long pressure, is to be treated by a solution of sulphate of zinc or nitrate of silver, and its depression by inflation, by means of Politzer's air douche. If there is perforation of the membrane, the patient's system is to be built up by tonics, any excessive discharge removed by means of a solution of boracic

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* *Lehrbuch der Ohrenheilkunde*, Fig. 5, s. 407.

acid and absorbent cotton. Should there be granulations, they are to be touched with a probe on which a small bead of nitrate of silver is fused, and then an artificial membrane worn until the parts heal.

Fibrous and Myxofibromatous Tumours.—This form of tumour is chiefly to be found among the females of the coloured races and in the lobule of the ear, from simple piercing of the lobule in the upper portion. It has been stated, and we at one time considered it, to be entirely due to the irritation of the mixed metals in the earrings worn, but we have found such not to be the case, because so many of the coloured women wear these earrings without any irritation, but only when the lobule has been pierced at its lower point, and the cartilage cells escaped. Having seen a large number of cases, we feel convinced that, in the coloured race all forms of irritation of the cellular tissue cause it to take on a peculiar form or growth of fibrous tissue; this we have noticed in various portions of the body, even penetrating to the uterus and ovaries. The form of fibroma is recurrent, and a simple puncture will sometimes develop them in a system that is predisposed. They are rarely found in the light-coloured, but mostly in the darker races. I have

Fig. 14.

Fibroma of Lobule.

never seen them in the white. In nine cases of which I have notes, five required a second operation for removal, two a third, and in two others the entire lobule was removed for a complete extirpation of the disease. If, however, in the first operation, every portion of the fibrous tissue is removed, there is no return; but if there be left but a single fibre of this elastic tissue, a tumour similar in structure will develop from the cicatrix. In my early operations, I simply removed these tumours as recommended in works on general surgery, but found they always returned, so that in 1869 I resolved to make a change in my method of operating—*i.e.*, by carefully dissecting back the skin

covering them, then cutting out the entire fibrous tissue until nothing was left of it, and seeing that a sufficient number of stitches either of fine black silk or silver wire, were employed to close the wound, leaving a small opening at the base for drainage, which opening subsequently closes by granulation. The lobule of the ear is supported by isinglass plaster and a bandage, and dressed with lint. In the microscopic examination of the tumours they are found to contain yellowish white fibres and some fat cells. The following is an interesting case, showing how large they will grow after imperfect removal, and also that they are frequently found in both ears. Mary A., aged twenty-five, single, dark-coloured skin, was distressed with the deformity of symmetrical tumours, of unusually large size, on both ears. The tumour seen in Fig. 14 had been removed by a surgeon six years previously, but had again returned, very much increased in size, and was trilobed. The tumours involved the whole of the

Fig. 15.

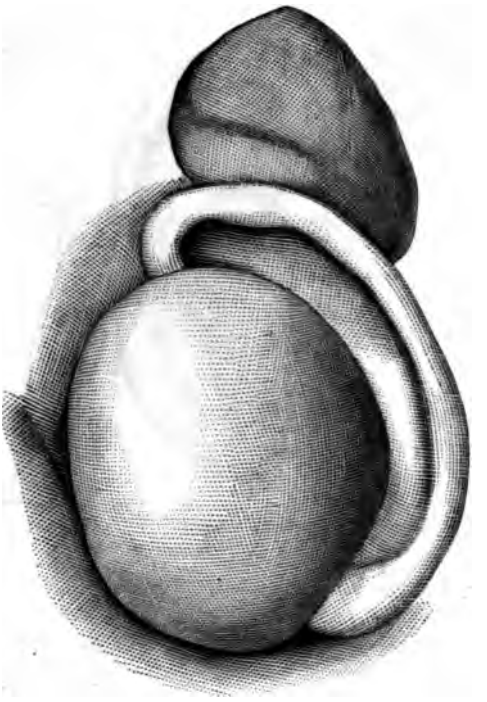
Myxofibroma of Auricle.

lobe and part of the helix and antitragus. It required a tedious dissection, to save sufficient skin to cover the exposed surface, and to avoid deformity, which was happily accomplished. The patient was under the influence of ether as an anæsthetic for one hour, and eight ounces were employed. The second ear was operated on in a similar manner; the patient, however, passing more quickly under the influence of hydrobromic ether, and the operation was completed in half an hour, with the use of two ounces of ether.

Myxofibroma of Auricle.—The next variety is termed myxofibroma of auricle. The microscopical characters in a case of this occurring in a white-skinned individual, are of interest.

The young lad, aged eleven, was a patient of Dr. J. M. Smith, of Gordonsville, Virginia. At the age of two years he received a scratch from a toilet-pin upon his left auricle. The scar soon developed into a distinct tumour, which, at the end of eighteen months, being of the size of a buckshot, was removed by the knife. Almost immediately it returned in the place of the scar, but was not removed until at the end of about two years, when it was carefully dissected from the cartilage, and found to be about three times the size of the original growth. The wound was touched with carbolic acid, and allowed to heal by granulation. Again the growth returned, and having obtained the size of double that of the second tumour, was, after the lapse of two years, removed;

Fig. 16.



Angioma springing from the external auditory meatus, escaping in part by the meatus, and in part behind the ear making its way between the cartilage and the bone.

but on this occasion, as upon the previous ones, in such a manner as to include in the dissection as little as possible of the surrounding tissue.

On December 19, 1877, the case came under the care of Dr. C. R. Agnew, of New York, who reports.* It presented the external physical features delineated in the accompanying illustration (Fig. 15), taken from the tumour immediately after removal.

* *Trans. Amer. Otol. Society*, vol. ii. Part ii. 1878.

After consultation with Dr. William H. Van Buren, the tumour was removed, and with it nearly all the cartilage of the auricle, down to the bony ring of the external auditory canal, leaving the pendant lobule, and skin enough to make a projection somewhat resembling a small auricle. The wound healed by primary adhesion throughout. In June, 1878, the tumour again began to recur, showing itself as a small nodule in the lower end of the scar near the lobule, while the other part of the line of healing remained quite healthy. Immediate removal was again advised—whether the advice had been carried into effect the doctor had not heard.

Dr. C. Heitzmann made a careful microscopic examination and drawing, and reported the tumour to be a myxofibroma.

Cylindroma is a name given to a tumour which, according to the terminology of the present day, would be called a myxoma cartilaginum.*

Angiomata are bloody tumours of the ear, which grow in the meatus and in the depres-

Fig. 17.

Angioma of External Auditory Meatus.

sion between the mastoid process and the condyloid process of the lower jaw. Fig. 11 is an example which came under our care, the pressure causing absolute deafness, facial paralysis, and injury to the brain. The larger mass was in the meatus, and the smaller one passed out, making its way behind the cartilage, causing atrophy of the mastoid process, with a tendency to rupture of the larger tumour, which ultimately took place, and death followed. No opportunity for a post-mortem was given.

Another instance (see Fig. 17) came under my care, and this, as will be seen by the drawing, emerged from, and was attached to, the meatus. This tumour was ligated and covered with tannic acid, and was entirely cured by this treatment. It is reported that Jüngken ligated the common carotid artery for a rupture of one of these tumours, and a nearly fatal hæmorrhage occurred. Seven years after the operation there occurred a

* Charité Annalen, "Pathological Anatomy of the Ear," H. Schwartze, p. 38.

fresh hæmorrhage from the tumour, and death. Another form of blood-tumour is termed othæmatoma, hæmatoma auris. This is usually a tumour in the early stage, of which fluctuation can be felt. The fluid is blood, and it is situated under the skin of the auricle, and when of a severe or aggravated form, as seen in the insane, the blood, or serum of the blood, may be found between the perichondrium and cartilage. In the early stage there may be heat, redness, and pain, especially if it is of a traumatic origin, as from a blow, or bruise against a stone wall, &c. In this latter form, suppuration and spontaneous rupture may occur.

Pathology.—It is said to depend upon a pathological condition of the brain, but we believe that it is produced by violence, &c.

By the application of cooling lotions the hæmorrhage is generally reabsorbed; and if tincture of iodine is employed, with support, the perichondrium may again become attached to the cartilage, and no permanent deformity be left; but if it is neglected, thickening and cicatrical shrinking of the auricle takes place, caused by chondromalacia or softening of the cartilage. A gelatinous material takes the place of the true hard cartilage.

Malignant tumours are to be found involving the cartilage of the ear, the meatus, and the temporal bone. One form is termed the chimney-sweepers' cancer, which has been described by English surgeons. Epithelial cancer of the auricle is also met with, and, in the case of an old woman, we found it extend into the middle and internal ear. A case of primary epithelial cancer of the meatus is described by Delstanche, which began as a small nodule upon the inner surface of the right tragus, accompanied by severe pain in the ear and over the side of the head. This soon ulcerated, destroyed the tragus, and extended into the meatus, leaving a surface destitute of epithelium, and covered with small growths, resembling granulations, which on microscopic examination showed the characteristics of epithelial cancer. At the end of eight months the patient died, having gradually lost the sight of the right eye, and the senses of taste and smell—the disease having steadily progressed till nearly the whole of the temporal and sphenoid bones had been destroyed.

Schwartze* states that he has seen three cases of primary epithelial cancer of the temporal bone, and he gives a list of five others. There have been twenty cases in all, in which death generally resulted from marasmus or pressure on the brain, sometimes from basilar meningitis.

When malignant tumours involve the skin they can be removed by caustics.

If the cartilage is involved the only effectual treatment is entire removal. If in the meatus the operation is more difficult, and the only agent which exerts any control (where the knife, saw, or sharp spoon cannot be used) is the internal administration of Fowler's solution of arsenic, continued in small doses, from one to two drops three times a day for months.

Osteosarcoma of the tympanum, extending into the meatus, has been observed by several surgeons, and a number of cases of round-celled sarcoma. Reports exist of three cases of the above, all occurring on the left side.

A boy, 3½ years old,† healthy, and of healthy parents, without previous pains or inflammatory symptoms, had a serous discharge from the right meatus, and two weeks later the meatus contained a tumour, which was supposed to be an ordinary polypus. On removing this with the snare, four weeks from the beginning of the discharge, the deeper meatus was found to be filled with other similar growths, resembling

* Op. cit., pp. 26, 27.

† *Archives of Otology*, March, 1880.

granulation tissue, springing from all parts of its walls and the tympanum. The drum membrane and ossicles had been discharged. The patient died.

Schwartze* describes a well-marked lymphoma or lympho-sarcoma tumour, the result of inflamed glands lying over the mastoid process. We have seen these glands much inflamed, but never so large as described by Schwartze, who states that he has seen one as large as the fist, hard and extremely sensitive to the slightest touch. The same authority states that epithelial cancer can occur primarily in the mastoid process, beginning with darting pains and a red, extremely hard, swelling of the mastoid. After incision or spontaneous rupture a foul ulcer is formed, which rapidly becomes deep, and give rise to frequently recurring hæmorrhage. After some months the hard infiltration of the neighbouring lymphatic glands extends to those in the parotid, which lie in front of the auricle. In the treatment of these lymphatic gland tumours, free-leeching, and the subsequent use of iodine, both externally and internally, is our usual prescription. In the second class, we would advise the removal of all diseased bone; while the use of arsenic, internally, should be employed. Cases of parotidean and intra-tympanic malignant tumours are rare, and of a complex nature, adenomatous, sarcomatous, cartilaginous, and myxomatous; the literature on this subject is scanty.† An interesting case is reported by Dr. H. Knapp, of New York.‡ We have only given the important points in the case. First, its origin: which was in the parotid region. There was an external tumour which had existed six years before the internal made itself noticeable; and it then extended to the middle ear. Its course was inwards, causing deafness in one night, this deafness was the result no doubt of the pressure of the tumour occluding the whole cavity, from serous or hæmorrhagic effusion, or of pressure on the nerve. The age of the gentleman was thirty-seven, his left ear was affected with chronic otorrhœa, his right ear never discharged. When the left ear was closed he could understand ordinary speech at five feet, and hear the watch tick when in contact with the right ear, mastoid process, and forehead. The right membrana tympani was uniformly bluish red, slightly convex, and greatly dislocated forward. The cone of light was absent, but there was a dull roundish reflex on the posterior lower part. The drumhead yielded to the probe (with no increased sensibility to the touch) as if a soft substance, harder than liquid, were behind. On the next day, finding the condition of the patient unchanged, Dr. Knapp made an incision with a paracentesis needle into the drum membrane, in front of and below the handle of the malleus. The edges of the wound at once retracted, and through the gaping opening a fleshy growth extruded, filling the space. The incision gave rise to considerable hæmorrhage. The clinical diagnosis was primary parotidean growth, which entered the tympanic cavity, through the Glasserian fissure or its vicinity, and that the tumour was *adeno-chondrosarcomatous*. Dr. Sands, by the request of Dr. Knapp, removed the parotid or external tumour on June 26, by a vertical incision, measuring from three and a half to four inches in length, extending from the level of the meatus down to the lower end of the growth, but as much of the latter as possible was removed by means of the fingers and dressing forceps, without chiselling the bone. The patient remained in the hospital until the wounds had almost healed. July 26.—The wound in the neck is almost healed, but the pain in the region of the ear continues. By means of a curved blunt-pointed knife portions of the growth were cut off, bleeding active. The reduction of the size of the mass was attempted by Dr. Buck, who had the patient then in charge, by gnawing away small portions with a miniature "rongeur," Dr. Knapp then being

* Op. cit.

† Paget, *Lectures on Surg. Path.*, i. p. 201 :—Virchow, large work, chapter Chrondromata, vol. i. p. 435.

‡ *Archives of Otology*, vol. viii. No. 4, Dec. 1879.

absent in Europe; but after one or two attempts he was obliged to desist. As the blood poured from the ear in a continuous stream, the bleeding had to be arrested by stuffing the ear with cotton, and applying pressure by means of a bandage passed over the head and under the jaw. On the same day another attempt was made, but with no better success, and it was followed by the formation of a large abscess on the side of the neck just below the mastoid process, and the patient was again transferred to Dr. Sands. No other operative interference was made by the surgeon, and the tumour continued to grow, and by October its base was six inches in diameter, and there were repeatedly profuse hæmorrhages. In the last stage, according to Dr. Peck, who took charge of the case, the tumour measured in circumference at the base twenty-two inches, in antero-posterior diameter eight inches, in the vertical seven inches. The patient died fifteen months after the first operation. Dr. Knapp in his concluding remarks adheres to the opinion that there was a connection between the tumours, and holds to the idea that the aural tumour might have been removed, together with the parotidean, from the posterior part of the glenoid fossa. We are also of the same opinion; and if a part was removed, why not all the tumour by Dr. Sands. This was the only chance for the patient. The microscopic examination of the condition of one of the masses removed, revealed with a low power that the tumour was composed of round, oblong, and branching alveoli filled with medium-sized cells, in other words, cartilage cells, which seemed to enter largely into the composition of the matrix of the tumour. No post-mortem was permitted.

Finally, the following are offered as conclusions: that all morbid growths of the ear may be comprised under the following heads:—

1.—Under the head of sebaceous, encysted, osseous, fibrous, fibro-cartilaginous and teleangiectatic, or bloody tumours, associated with caries of the temporal bone or mastoid process, and involving the auditory nerve or some of its branches.

2.—Morbid growths, including angiomatous, epitheliomatous, sarcomatous, chondromatous, and alveolar. These may fill the external meatus, or the internal auditory canal, and finally involve the auditory nerve, causing death from marasmus, pressure on the brain, or basilar meningitis.

3.—Osteo-sarcomata, chondromata, lympho-sarcomata, fibro-sarcomata, involving the common trunks of the facial and auditory nerves, the tumours being found at the bottom of the internal ear.

4.—Tumours may be gliomata, cerebral tumours, or morbid growths, usually found involving the eye at first, but in a case described by Bruckner, which was the result of a fall on the back of the head, accompanied with complete deafness, giddiness, and inflammation of the middle ear, pulsating tinnitus, and ending fatally.

Fatty metamorphosis of the organ of Corti, resembling sarcoma of the auditory nerve, as described by Moos, amyloid degeneration of the auditory nerve as described by Voltolini, and corpora amylacea, found in the semicircular canals of man, and described by Lucae.

Treatment of morbid growths of the ear.—Where such growths can be reached, the only successful plan of treatment is the early removal by excision by the knife, preventing danger of hæmorrhage by the use of the ligature, clamp-forceps, thermo- or galvano-cautery. Removal of diseased bone by forceps, sharp spoon, revolving knives, or the surgical or dental engine.

The most important plan of treatment is the removal of all vascular or polypoid growths as soon as they are brought to the notice of the aural surgeon. All puncturing or irritating of the above growths by means of needles, small sharp knives, or caustics, is to be entirely avoided, for, in our experience, all such meddlesome

surgery tends to increase and inflame them, and may change an originally benign growth into a malignant one.

The only remedy that we have found to prevent the spread of malignant growths is some one of the preparations of arsenic, and none has been borne so well as the old preparation of the arsenite of potassium, or Fowler's solution, given in small doses, and continued for a long period.

When the system shows the influence of the arsenic, by œdema of the eyelids, great whiteness of the skin, with puffiness of the same, it should then be withdrawn for a time, to be again employed in smaller doses, always well diluted with water. Arsenic first locates in the plasma; it then forms a part of the histological elements, and penetrates every part through the nutrition, even into the hair (Gubler).

Morbid growths are organic substances possessing an inferior degree of organization or development; and therefore arsenic is the agent to be employed for their removal, as we know that it destroys the large as well as the smaller organizations.

We might make an exception in favour of arsenic as an escharotic, as it seems almost possessed of intelligence; and, if watched, will be found to attack the different layers in a new formation like cancer, and spare the neighbouring healthy tissues.

DISCUSSION.

Dr. MÉNIÈRE, Paris: The extent of the subject is very great, too great to allow of its being disposed of at one discussion. I shall confine my remarks accordingly to aural polypi. The classification of these I will not discuss, nor the causes giving rise to them, but say that they may appear with or without otorrhœa. I go straight to the treatment, which is my important point. The most rational treatment is excision with cauterization of the pedicle. The instrument generally used is Wilde's snare, with various modifications, one of which, proposed by myself, enables us to place the tube in different directions, so that the wire can be easily passed to any position necessary. For the after-treatment of cauterization, I prefer the saturated chloride of zinc, and the nitrate of mercury. In cases where the root of the polypus is hidden by the membrane, and the perforation is too small to allow of the proper application of the caustic, Politzer advises the incision of the membrane to look for the pedicle. This is not easily effected, and the operation is objected to by many patients. In such, I have seen good results arise from the application of rectified spirits to the parts for the space of ten or fifteen minutes two or three times daily.

Dr. GUYE, Amsterdam: According to my experience, multiple exostoses generally come to a standstill as to their growth when they touch each other. I have seen an osseous bridge formed between two exostoses, and removed it. The formation of such a bridge probably arose from erosion of the summits of the exostoses by a purulent discharge existing for a considerable period. As an instance of the influence of the meeting of the exostoses on preventing their further growth, I may instance the case of a young lady, whom I had treated for a chronic deafness. At that time there was no exostosis present. I saw the patient again two or three years afterwards, and found three large exostoses, which nearly met in the centre. I was then alarmed lest a closure of the meatus should ensue: but saw her some six or seven years afterwards, and found no further development. I cannot agree with Dr. Cassells as to the distinction he drew between exostoses and hyperostoses.

M. GELLÉ, Paris: I once came across an aural polypus growing on a psoriatic

plaque. It occurred in a man suffering from psoriasis in an aggravated form. The left ear was covered by a large furfuraceous patch of psoriasis, and the right ear presented a polypus protruding from the external meatus. There was no discharge. On removal, it was found to arise from a yellowish red surface external to the membrane. The polypoid proliferation without discharge is the remarkable feature of the case, thus allowing of a proliferation without the attention being called to it till the hearing became affected by the size of the growth. Will Dr. Cassells tell us whether he has seen a great number of cases of exostoses, if otherwise, I cannot understand how he could present us with so complete a description. For my part, I have seen very few cases—two or three—and these were in gouty persons. I am struck by the great number of cases to be seen in a short time at Glasgow, compared with what I have seen in Paris in a great number of years. I will describe what has been the result of my examination of sixty skulls of flat-headed Indians belonging to the anthropological museum of Paris. In these, ten skulls showed simple or multiple exostoses of large size, generally on both sides. In six others, the external auditory canal is obliterated or narrowed by the general closure of the walls.

Dr. Gellé showed drawings of these lesions. The exostoses in some were tooth-shaped or pear-shaped of different sizes, and pediculated. Others had a large base. They were frequently found on the posterior wall.

Dr. Loewenberg, Paris: I have seen a case where in both ears the common exostoses existed, but were joined by a thin transverse plate of bone, which completed the closure. The galvano-cautery destroyed them, and improved the hearing. I have come to a conclusion opposite to that of Dr. Gellé, as I have found exostoses frequent in Paris. I have never seen polypi arise without suppuration, and as they often develop after scratching in eczema, so in psoriasis, they are produced by scratching, and not by the disease itself, which is a dry one. In the same way, after furuncles polypi increase rapidly. I strongly recommend the galvano-cautery, not the snare, for their removal. A pointed end should be used for passing through a perforation into the cavity.

M. Gellé, Paris: In reply to M. Löwenberg, I would remind him that in psoriasis there is no itching. The proliferation of the skin has been seen and described in different parts of the body besides the ear.

Dr. Knapp, New York: A year ago, Dr. Cl. J. Blake was kind enough to take me through the Peabody Museum, in Boston, and show me 200 or 300 skulls of the Mound Builders of Tennessee, among which he had found, in about 25 %, exostosis in the auditory canal. I saw that these growths were situated on the tympanic portion of the canal, were oblong and ragged, of different sizes, but never filled the calibre of the meatus completely. The skeletons of these pre-historic people showed many diseases of bone, especially healed fractures, but no symptoms of syphilis. Two weeks ago I had the privilege of speaking with Professor Virchow on this subject. He said these formations in the pre-historic man were supposed to be the result of continued irritation from foreign bodies, which these races probably used to stick in their ears. As to the exostoses in the inner part of the ear canal, I know that in a low state of development they are quite frequent. We are only too much accustomed to overlook them, as they cause no trouble. I am not so convinced as Dr. Guye, that the multiple mammillary exostoses never occlude the canal totally. In one recent case I found

that the skin bridged over three of them uninterruptedly. On incision I found that only a thin probe could be passed through the little aperture which their bony crests left free. I chiselled the canal wider with good result. In another case I found the bony closure complete, but not having observed the case before, and the history being unsatisfactory, I did not know positively whether the bony closure was the result of mamillary exostoses or not. In regard to the hyperostosis of the ear I would say that syphilis should not be left quite out as a cause. I will mention one case as representative of many. A young man had parenchymatous keratitis four years ago, *i.e.*, in his fifteenth year; two years later he acquired a chancre, as he stated. For a whole year his hearing has diminished, not suddenly. He came to me six months ago, completely deaf on both sides, the inner parts of his ear canals pinkish and narrowed (verte) by swelling of the walls, which gave a bony feel to the probe. The membranæ tympanorum were pinkish, thickened, scarcely movable with Siègle's otoscope—symmetrical characteristic pharyngeal ulcers. It seemed that he was doubly tainted—viz., with inherited and acquired syphilis. His deafness must have been in the inner ears as well as in the outer and middle, for even a complete bony ankylosis of the footplate of the stirrup would not account for his absolute deafness. I took him to the New York Ophthalmic and Aural Institution, gave him the best of care, and Hg, KI, and Zittmann's decoction, as much as his system would stand, for five months. The pharynx got well, the hyperostosis of the ear canal diminished, so as to make the parts almost appear normal, the membranæ tympanorum became pale and thin, but the deafness remained absolute.

Dr. URBAN PRITCHARD, London: In the course of my experience I have met with three forms of exostoses. First, the multiple smooth rounded exostoses which are hyperostoses, due, I believe, in most cases to a gouty or rheumatic diathesis, these are found very frequently in private patients, very rarely in hospital patients. Second, the exostoses found as the result of bone irritation in old standing otorrhœa; these are not so rounded, but have usually broad bases, they are not so frequently met with (except in hospital patients) as the first class. Lastly, a rare form of exostosis, which is single, usually pedunculated, and with a soft exterior. Dr. Pritchard related a case of this third variety, showed the tumour removed entire, and a section of it under the microscope. The removal of this tumour was eventually effected by softening with dilute nitric acid ½ per cent., and subsequent breaking through the pedicle by means of a dentist's elevator. There was no other disease of the ear, so that the hearing was completely restored.

Professor JONES, Chicago, related a case of single exostosis in which the growth disappeared without treatment.

Dr. BARR, Glasgow: While exostosis belongs more to the nature of tumours, hyperostotic contraction of the external auditory canal seems usually to have an inflammatory origin. It is often associated with, or the result of, chronic otorrhœa, although it does undoubtedly occur in the non-suppurative catarrhs. I have found generally that hyperostosis is attended by a swollen inflamed state of the cutaneous lining of the external canal of the ear. I look upon hyperostosis more as the result of a chronic periostitis with increased formation of osseous tissue, and this increased osseous formation may at the same time exist in the walls of the tympanum and in the mastoid cells in the neighbourhood of the internal canal of the ear. A case

was related showing that treatment of the inflamed, thickened condition of the cutaneous lining of the canal of the ear, associated with hyperostosis, was attended by great improvement in the hearing.

Dr. REEVE, Toronto, could not agree with Dr. Cassells as to the causes and development of the bony growths.

Dr. SAPOLINI, Milan, exhibited a new instrument for at once holding and cutting the polypoid growths in the external meatus. It is especially useful when the pedicle is strong, hard, and dense. It can be employed in any position in which the pedicle may be found.

Dr. CASSELLS, Glasgow: The various gentlemen who have spoken in this discussion have overlooked the most important point of my paper—viz., the difference between aural-exostosis and hyperostosis—confining their remarks to those bony growths which have their origin in the osseous portion of the external auditory meatus. In reply to Dr. Gellé, who has asked if I have made a special study of the subject, I refer him to the illustrated sheet of exostoses removed from the ear by operation (using a mallet and gouge for that purpose) as an evidence that I have done so. I have never seen bony tumours of the external meatus arising in the cases of patients who have had syphilis, as Dr. Knapp has described in the course of discussion.

Les lésions nerveuses dans la Surdité.

Dr. GELLÉ, Paris.

Quand on trouve de la surdité par la voie crânienne on ne peut conclure à une lésion de l'oreille interne que si l'on a acquis la certitude que la platine de l'étrier est mobile. La proposition généralement admise que l'auscultation par la voie des os du crâne peut fournir des notions exactes sur l'état du nerf labyrinthique, est démontrée fausse par l'observation clinique. On trouve souvent, en effet, sur la même oreille, l'audition crânienne perdue et celle par l'air conservée.

Le diagnostic différentiel est toujours délicat et souvent impossible. Cependant, l'immobilisation de la platine de l'étrier est rarement une lésion isolée, et des lésions de l'oreille moyenne accessibles à nos moyens d'investigation guident le diagnostic. Il peut être, cependant, difficile de faire la part de ce qui revient à chaque lésion dans la production de la surdité. Le clinicien devra, en ce cas, surtout, se guider sur l'existence des symptômes nerveux, connus pour être surtout d'origine labyrinthique: telle la trilogie de Ménière, surdité, vertige et sifflement, avec ou sans chûte. Sachons, cependant, que sans lésion du labyrinthe, cette trilogie symptomatique a pu exister. Le nerf auditif peut être actionné par des lésions extra-labyrinthiques auriculaires ou autres. Quand l'étrier se meut, l'oreille moyenne étant saine, l'origine nerveuse des troubles observés est évidente. L'étrier est-il mobile, le labyrinthe est-il enmuré? "That is the question."

C'est ici que l'expérience de Lucae trouve son application. Lucae comprime fortement l'orifice du méat, cette pression, transmise par l'air au tympan, agit de là sur la platine de l'étrier et sur le labyrinthe, en fin de compte. Si l'étrier est soudé, rien ne se meut; et les efforts de la pression sont nuls, si l'étrier est mobile et que le labyrinthe soit sain, le son de la montre ou du diapason, par voie osseuse

(bosse frontale droite, par exemple), est affaibli et quelques bourdonnements prennent naissance; mais quelque soit l'effort fait sur le méat, l'audition n'est pas atteinte; si, au contraire, le labyrinthe est l'origine des phénomènes dits de Ménière, on s'aperçoit que le bourdonnement diminue ou cesse au moins, que des vertiges apparaissent, et l'audition par la voie osseuse est éteinte, s'il en existait encore trace; ce sont bien là des signes labyrinthiques.

Ce procédé est douloureux et peu pratique; je l'ai modifié de la façon suivante: un tube de caoutchouc, long de 0,15 centimètres, s'adapte d'un bout au bec de la poire à insuffler ordinaire, et de l'autre est introduit dans le conduit auditif extérieur, où il est fixé hermétiquement. Dès que le diapason normal en vibration est posé sur le tube, l'audition a lieu. Si on presse alors la poire à air, le sujet annonce que le son devient moins intense, et si le son était déjà faible, il disparaît. Aussitôt que la pression cesse le son reparaît. Grâce à l'élasticité naturelle des parties, on peut répéter à volonté l'expérience avec la même succession de piano et de forte; ceci se passe à l'état sain, sans douleur, sans trouble. On obtient la même oscillation, si le diapason est posé sur le front (bosse frontale). Si le tympan est raidi, immobilisé, l'épreuve est sans effet. Si le tympan est ramolli, il cède à la poussée, et le son s'éteint à la première ou à la deuxième pression centripète.

Si en ce cas le labyrinthe est malade, hyperesthésié, &c., à chaque pression il reçoit un choc qui cause, soit un vertige, soit du bourdonnement d'oreille.

Avec cette manœuvre on interroge le nerf labyrinthique, on agit sur lui par l'intermédiaire de l'étrier, de la chaîne et du tympan. Les modifications de l'audition qui naissent sous l'influence des pressions montrent l'état de mobilité et d'élasticité de l'appareil de transmission du son; les troubles nerveux annoncent une lésion du nerf lui-même.

Expérience du téléphone à ficelle et de la tige conductrice.—J'ai trouvé ce procédé pour sonder plus avant la capacité acoustique et la mobilité de la platine de l'étrier. Voici quel il est: une tige cylindrique de 3 millimètres d'épaisseur, longue de 10 à 12 centimètres, bien arrondie à ses deux boutons est introduite doucement et sans hésiter le long de la paroi supérieure du conduit auditif jusqu'au contact des osselets (apophyse externe et vestige de la chaîne et du tympan, pôle supérieur). Au bout extérieur de cette tige d'ivoire est attachée la ficelle courte d'un petit téléphone. On a alors un chemin direct et court du dehors à l'étrier; la transmission possède ainsi une grande puissance, et j'ai pu par ce procédé faire entendre nettement, en parlant dans le téléphone, des gens qui ne percevaient d'ordinaire que le bruit d'une voyelle criée à l'oreille.

Enfin, une deuxième expérience est possible: sur la tige on peut appliquer le diapason en vibration, et le son acquiert une force de pénétration extrême; on peut ainsi aller un peu plus loin que par les procédés connus à la recherche de la sensibilité acoustique et de la mobilité de l'étrier.

La surdité sans lésion de l'oreille moyenne et externe se rencontre dans bien des cas; pour les étudier méthodiquement j'emploie la division suivante en trois chapitres: le premier étudie l'anatomie pathologique suivant que la lésion cause siége au labyrinthe, sur le nerf auditif, dans le nerf facial trijumeau, &c., le centre nerveux: le deuxième chapitre parle des affections causes, diathèses, hémorrhagies, diabètes, albuminurie, &c.; le troisième fait la séméiotique des symptômes dits labyrinthiques. Le quatrième s'occupe du traitement.

Voici quelques cas de ma pratique où la lésion existait ailleurs que dans l'oreille moyenne et externe, où il y eut surdité avec ou sans bourdonnements ou vertiges.

1.—Surdité et paralysie faciale gauche, hémorrhagies conjonctivales, voile paralysé, pas de bourdonnements, ni de vertiges. Mort par hémiplégie et coma. Diagnostic: tumeur intra-crânienne au niveau du trijumeau, du facial et de l'acoustique.

2.—Surdité unilatérale, vertiges avec tournoiement et menaces de chute, bourdonnement d'oreilles, dyspepsie, gastralgie. Guérison par l'hydrothérapie.

3.—Surdité complète, après névralgies faciales de longue durée, cataracte de l'œil droit, bourdonnements à droite faibles, pas de vertige.

4.—Hémorrhagie cérébrale, hémiplégie gauche et faciale gauche, hémianesthésie gauche des organes des sens, retour de l'ouïe le dixième jour, aucune lésion de l'oreille.

5.—Surdité sans lésions visibles, vertiges, crises gastriques chez un goutteux, congestion céphalique et du pharynx.

6.—Surdité à la suite d'hémorrhagies internes extrêmement abondantes, bourdonnements surtout après le repas, estomac excellent, anémie.

7.—Céphalée nocturne atroce, surdité, éblouissement, vertiges avec tendance à se renverser en arrière, regard vague, léger strabisme, difficulté de la marche, congestions énormes des yeux, à répétition, pas d'accidents épileptiformes, pas de douleurs fulgurantes.

8.—Surdité dans la convalescence d'une maladie grave, surdité complète, totale, en deux jours, après une bronchiopneumonie grave, de trois mois, légère albuminurie.

9.—Surdité, syphilis intra-crânienne, tumeurs gommeuses à la voûte palatine, paralysie faciale, anesthésie après névralgies faciales, obtusion de la mémoire, œil engorgé à droite, rien à l'oreille.

10.—Surdité dans le tabes, au début; phénomènes très-variables d'intensité, bourdonnements par moments agaçants—le cachet spécial est que l'ouïe se perd peu à peu pendant la conversation, par fatigue nerveuse probable.

11.—Surdité verbale, service de M. Magnan; une thèse du Dr. Skworsoff, parue 1881. J'ai été appelé à examiner les oreilles qui étaient saines.

Zur physikalischen differentiellen Diagnostik zwischen Erkrankung des schallleitenden Apparates und Nerventaubheit. Mit Demonstrationen.

Professor A. Lucae, Berlin.

In allen Fällen, namentlich in den chronischen Fällen von Schwerhörigkeit bei erhaltenem Trommelfell und freiem äusseren und mittleren Ohre bedarf es neben der objectiven Untersuchung noch anderer diagnostischer Hilfsmittel, um eine Erkrankung des schallleitenden Apparates von einer Affection des Nervenapparates zu unterscheiden.

Die bisher zu diesem Zweck übliche Prüfung der Schallleitung durch die Kopfknochen mit Hülfe einer, auf den Scheitel gesetzten Stimmgabel, genügt dieser Aufgabe allein nicht. Auf Grund der Theorie von Professor Mach, nach welcher die, durch die Schädelknochen im Labyrinthe angelangten Schwingungen durch den schallleitenden Apparat nach aussen abfliessen sollen, hat man bekanntlich die pathologische in dem allein oder schwerer erkrankten Ohre auftretende Tonver-

stärkung auf eine Erkrankung des schallleitenden Apparates bezogen, während man in dem Falle, dass der Ton der Gabel in dem gesunden oder in geringerem Grade erkrankten Ohre stärker gehört wird, eine Erkrankung des innern Ohres annahm.

Redner hat bereits früher durch eingehende Untersuchungen jene Theorie von Professor Mach widerlegt, und findet seine Ansicht durch neuere Experimente vollkommen bestätigt. Er demonstrirt zunächst einen von ihm angegebenen älteren Versuch, welcher von folgendem Gesichtspunkte ausgeht: Wenn die Schwingungen der auf den Schädel gesetzten Gabel wirklich aus dem Ohre entweichen, so müsste, sobald man den Ton derselben Gabel gleichzeitig durch die Luft in den äusseren Gehörgang leitet, eine Interferenz und Schalldämpfung eintreten. Dies ist jedoch keineswegs der Fall; man hört im Gegentheil den Ton bei dieser doppelten Zuleitung zum Ohre sogar merklich verstärkt.

Mit Hülfe des, von Dr. Rinne angegebenen Versuches, lässt sich ebenfalls die Unhaltbarkeit der Mach'schen Theorie nachweisen. In diesem Rinne'schen Versuche wird eine Stimmgabel auf den Schädel gesetzt und gewartet, bis der Ton gänzlich verschwunden ist; nähert man dann die Zinken der nicht wieder angeschlagenen Stimmgabel der äusseren Ohröffnung, so hört das normale Ohr den Ton von neuem, oder—wie es hier der Kürze wegen heissen soll—der Rinne'sche Versuch fällt positiv aus. Bekanntlich hört man die auf den Schädel gesetzte Stimmgabel auf dem zugehaltenen Ohre auch dann stärker, wenn das letztere nicht vollständig luftdicht abgeschlossen ist; es lässt sich nun nachweisen, dsss auch in diesem Falle der Rinne'sche Versuch positiv ausfällt, wenn man die Stimmgabel nach dem subjectiven Abklingen vom Schädel dem so geschlossenen Ohre nähert. Man beobachtet ferner an Schwerhörigen zuweilen, dass die Stimmgabel vom Scheitel aus auf dem schlechter hörenden Ohre stärker gehört wird und der Rinne-sche Versuch trotzdem für dieses Ohr positiv ausfällt. Es kann also in allen diesen Fällen von einer Behinderung des sogenannten Schallausflusses keine Rede sein.

Weit bessere Anhaltspunkte für die Diagnose giebt, nach langjähriger Erfahrung des Vortragenden, eben dieser Rinne'sche Versuch in Verbindung mit einer sorgfältigen Prüfung der Luftschallleitung auf tiefe und hohe Töne. Man benutzt am Besten eine kleinere tiefe (c) Gabel und als Ansatzstelle den Processus mastoides. In Fällen von bedeutender Schwerhörigkeit, wo die Flüstersprache nur in der Nähe des Ohres gehört wird, beobachtet man nun gar nicht selten einen positiven Ausfall des Rinne'schen Versuches, was mit Sicherheit auf eine vorwiegende Affection des innern Ohres, respective auf eine jenseits der Trommelhöhle gelegene Erkrankung schliessen lässt; je länger hierbei die Stimmgabel vor dem kranken Ohre vernommen wird, desto sicherer ist eine gleichzeitige Störung im schallleitenden Apparate auszuschliessen. Wird jedoch die Stimmgabel vom Processus mastoides aus, längere Zeit gehört, *i.e.*, fällt der Rinne'sche Versuch negativ aus, so handelt es sich um eine Störung im schallleitenden Apparate; es bleibt hierbei jedoch ungewiss, ob nicht gleichzeitig ein Leiden des Nervenapparates vorliegt. Zur Untersuchung dieses letzteren Punktes dient schliesslich die Untersuchung der Luftschallleitung auf sehr hohe in der viergestrichenen Octave gelegene Töne, welche erfahrungsgemäss selbst bei bedeutenden Hindernissen im schallleitenden Apparate noch relativ gut, dagegen bei Störungen im perispirenden Nervenapparat sehr schwach, respective gar nicht wahrgenommen werden. Redner bedient sich zu diesem Zwecke namentlich der auf Fis 4 abgestimmten Gabel.

Zu einer genauen Untersuchung auf die genannten tiefen und hohen Töne wird

die Hörzeit des zu untersuchenden, kranken Ohres mit der Hörzeit des gesunden Ohres des Beobachters verglichen. Die Differenz, mit Hülfe einer gewöhnlichen Taschenuhr oder besser eines Chrononops in Sekunden gemessen, stellt den Grad der Hörstörung für jene Töne dar. (Näheres hierüber, *Archiv für Ohrenheilk.*, Bd. xv.).

Die Beweise für die Brauchbarkeit dieser Methode findet Redner einmal in der Section zweier Gehörorgane, welche die bei Lebzeiten gestellte Diagnosen einer Erkrankung des Nervenapparates (Atrophie des Acusticus) und der Trommelhöhle (Adhäsion des Trommelfelles und der Gehörknöchelchen) bestätigte. Er hat ferner in 25 Fällen, wo er lediglich mit Hülfe dieser Untersuchungsmethode die Diagnose einer Erkrankung des schallleitenden Apparates stellte, die totale Excision des Trommelfells mit dem Hammer vorgenommen; in keinem einzigen dieser Fälle trat eine Verschlechterung der Hörfähigkeit, bei einigen sogar eine merkliche Hörverbesserung ein.

On Certain Conditions of the Eyes as a Cause of Loss of Hearing by Reflex Irritation.

Dr. George T. Stevens, New York.

The relations between affections of the ear and some parts not immediately connected have long been recognized. Thus worms in the intestines have been, doubtless with reason, regarded as cause of disease of the ear, and the process of teething in children, is, according to the experience of many, a somewhat prolific ource of earache. Several writers have recently pointed out in considerable detail the sympathy between the ear and the mouth, each demonstrating the fact that an irritation arising from some portion of the oral cavity has given rise to some form of nervous or nutritive disturbance in the ear. Efforts to explain these reflex phenomena by demonstrating a direct nervous communication between the mouth and the various parts of the ear affected would seem to be superfluous, for that it is unnecessary to establish the fact of any direct nervous line, in order to account for reflex irritation, must be evident to those who fully accept the doctrine of such reflex irritations. While it would be possible, perhaps, to point out real or fancied direct nervous communications between almost any two parts of the body, the doctrine of reflex irritation, as stated by the best authorities on such subjects, does not demand, as a condition of remote irritation, that there shall be a direct line of nervous communication.

According to this law, "the same peripheric cause of irritation, acting on the same centripital nerve, may produce the greatest variety of effects, including every functional nervous affection or disorder."

According to this law, also, different classes of conducting nerve fibres may be the subjects of irritation from the same cause; so that from the same excitation, modification of sensations of nutrition or of power may result; or, in other words, pain or loss of sensibility, inflammation or ulceration, increase or decrease of muscular power in a part, may each arise from the same cause of irritation, which may be seated in some distant part.

This being true, it is important that every source of irritation should be known and recognized. It is a fact in practice that the greatest proportion of diseases of the ear are regarded by writers upon ear affections as of purely local origin, or

of simple extension from contiguous parts; and the cases of reflex irritation have not been made to occupy a very prominent place in the literature of the subject. It is the object of this brief paper to call attention to a source of sympathetic irritation to which I have seen no reference.

My own experience and observation lead me to believe that reflex irritations arising from the eyes and affecting the sensations or nutrition of the ear are not of unfrequent occurrence, and, indeed, that they are much more common than would be supposed from the fact that so little attention, if any, has been bestowed upon them.

I have, in a Paper presented to another section of this Congress, endeavoured to point out certain principles relating to reflex phenomena resulting from difficulties in performing some of the functions of the eyes. My experience, as shown in that communication, and in various other Papers which I have presented to the profession within the last few years, appears to demonstrate the fact that many disturbances of nervous function, both of sensation and nutrition, may be induced by unfavourable conditions of adjustment of the eyes. That irritations may arise from the eyes, and be manifested in the remote parts, is evident; but a reasonable doubt may arise whether the amount of irritation arising, for instance, from a high degree of hypermetropia, or a state of insufficiency of ocular muscles, is of a degree sufficient to propagate itself in other organs. This doubt can only be solved by experience, and according to my own observation the irritation thus caused would seem to be a prolific source of nervous disturbances. I have often known a chronic neuralgia which has continued as a destroyer of the peace of the sufferer year after year, yield to the influence of appropriate lenses for the correction of the hypermetropia, or the astigmatism which existed. I have known chorea of many years' standing disappear, as if by magic, after a partial tenotomy of an ocular muscle.

Every oculist knows that difficulties in the adjustment of the eyes may, and often do, cause pain in the temples and brow. Then, according to the law of reflex irritations, it may cause pain or other functional disturbance in the ear.

Admitting that there are theoretical grounds for supposing that such sympathy may exist, we should still be bound to inquire whether there are any clinical facts to sustain the theory.

When, several years ago my attention was directed to the reflex disturbances from the eyes, I naturally sought to know whether the principle could be of practical application in diseases of the ear, and I have been accustomed during several years to examine the eyes of my private patients consulting me for ear troubles. The result is that in very many instances ocular defects have been found coincident with the ear disease. This fact alone would prove of little practical value, but an associated fact is that many cases of otherwise obstinate ear troubles yield quickly when the source of ocular irritation has been removed.

It is no part of my purpose to introducé statistics of cases to establish the truth I have advanced, but in illustration of it I will, in the briefest manner, allude to a single instance which cannot but suggest the value of relief to the eyes in some cases of ear diseases.

A lady of forty-two was tormented by subjective sounds, and her hearing was reduced one half. The ears when examined gave no indications of disease. Inflations with Politzer's bag gave no relief, general tonics, electricity, bromides, a change of air, all failed to modify in any degree the tormenting noises which de-

stroyed sleep, added to the general nervous irritability of the patient, and made her miserable. There was slight insufficiency of the external recti muscles, and there were pains in the temples and brows. After three months of fruitless attempts to relieve the patient by such measures as have been mentioned, a partial tenotomy of one of the internal recti muscles was made. In a very few days the roarings and hissings ceased, the hearing returned to the normal standard, and the lady was greatly improved in her general nervous condition. In this instance it is as certain as any thing in medicine that the relief not only followed, but was the legitimate result of, the greater freedom of the eyes, which up to the time of the slight operation had been kept constantly on the alert to maintain monocular vision.

I will not detain the Section by citing further illustrations, although many could be adduced, to show that relief to hypermetropia, to myopia, and other unfavourable conditions of the eyes, has been largely, and in some instances wholly, instrumental in restoring the hearing.

If I have with sufficient clearness suggested that ocular defects may be classed among the reflex causes of loss of hearing, I shall find it easy to impress upon those who hear me the importance of habitually examining the visual condition of ear patients, and of affording such relief to defective states of vision as the science of ophthalmology so richly affords.

DISCUSSION.

Dr. Knapp, New York: Not long ago I saw a young lady who during mumps had become completely deaf in one ear, without showing a trace of abnormity in the outer and middle ears. The other ear was perfect. The good ear being closed, she heard equally well when the bad was left open or also was closed. Tuning-forks by bone conduction were heard in the good ear only; passed up and down, when in vibration, they were heard in puffs before the good, but evenly and weaker before the bad ear. She evidently did not hear this with the bad, but with the good ear. This experiment to ascertain complete one-sided deafness, which I communicated four or five years ago, has since been of good use to me in a number of other cases. I know nothing of the anatomical cause of the deafness in cases like the above. They have been very rare in my practice, whereas I have not infrequently seen middle-ear disease (suppuration) as a complication in mumps. It may, perhaps, not be without interest to the Section if I say a few words about quinine blindness and deafness, of which recently a number of new cases have been reported in America (*Archives of Ophthalmology*). After taking doses from four grammes daily or more, sudden total blindness and deafness, with intense tinnitus aurium, set in. The deafness disappears in a day, the total blindness may last weeks and months; then central vision returns and slowly improves, frequently to the normal standard. The field of vision remains contracted. The light and colour-sense are weakened, but gradually recover their normal strength. The ophthalmoscopic appearances are most striking,—complete anæmia of the optic discs. This condition, showing in the developed cases the picture of total atrophy with exceedingly thin and scarce vessels, is permanent. There are milder cases also which last only one or several weeks and then get entirely well. The ears, even in the marked cases, show no abnormity in their outer and middle portions. I have examined the hearing of such patients by different tests; it was normal in every respect. They heard the whole range of musical tones, there was no contraction of the field of audition, and also the character of sound—clang tint, sound colour, or timbre—was well perceived.

Mr. Cresswell Baber, Brighton: I have been always much impressed with the importance of obtaining a means of diagnosis between middle and internal ear-deafness. I have employed Rinne's experiment in a considerable number of cases, and have found it of value. I would call attention to the effect of excessive pressure artificially applied to the ear in diminishing the perception of the tuning-fork applied to the bones of the head, as previously described by me in the *Lancet* (April, 1881), and consider it of importance, as showing the ease with which alterations in the state of the middle ear can interfere with the bone conduction.

Dr. Barr, Glasgow: If a person with perfectly normal hearing becomes suddenly affected with marked deafness, severe tinnitus aurium, and perhaps with giddiness, nausea, and vomiting, also with loss of the perception of the osseous conduction of sound, and on examining the ear soon after, no evidence of disease is found in the external and middle ear, the strong presumption is that we have to do with a sudden pathological change in the interior of the labyrinth—probably in the semicircular canals and vestibule. But in a case of pretty long standing, it would be wrong to assume that the cause of these symptoms is exclusively confined to the nervous apparatus of hearing, because no change is to be seen in the tympanic membrane or to be found in the Eustachian tube. Important changes may, for example, exist in the fenestral membranes, or in the recesses leading thereto, which cannot be recognized either by ocular inspection or by any other mode of examination. Indeed, the whole series of symptoms included in the term Ménière's disease may, as is well known, be called forth by diseased processes in the middle ear, which may produce undue pressure on the labyrinth fluid, such as thickened fenestral membranes, or undue pressure inwards of the ossicular chain. It was pointed out how abnormal states of the circulation of the brain must influence the circulation in the contents of the labyrinth, when we consider that the internal auditory artery is really a brain artery, and that the veins of the labyrinth open into the venous sinus of the dura mater. With respect to the treatment of hyperæmic conditions of the labyrinth, local blood-letting over the mastoid region would be a reasonable procedure. We know that the stylo-mastoid artery which supplies the soft parts over the mastoid process, inosculates freely with the internal auditory artery in the tympanic cavity, and in this way a distinct vascular connection is brought about between the labyrinth and the external parts.

Fonctions de la Trompe d'Eustache.

Dr. Edouard Fournié, Paris.

La communication de M. le Dr. Fournié porte sur deux points essentiels:—1. Sur les usages de la trompe d'Eustache. 2. Sur la question de savoir si le conduit de la trompe est habituellement ouvert ou fermé.

Sur le premier point, M. Fournié pense, avec la plupart des physiologistes, que le conduit de la trompe sert à mettre l'air de la caisse du tympan en équilibre avec l'air extérieur et à donner issue aux sécrétions de la cavité tympanique. En outre, il croit pouvoir affirmer qu'un des usages essentiels de la trompe d'Eustache est d'empêcher, par ses rapports immédiats avec l'air extérieur et avec l'air de la

caisse du tympan, la résonnance incommode des bruits extérieurs transmis par les parties solides dans la caisse du tympan.

M. Fournié appuie sa manière de voir sur ce fait que, lorsque nous fermons le conduit auditif externe, nous entendons les bruits organiques parce que les vibrations transmises par les parois du conduit acquièrent dans la cavité close, ainsi fermée, une intensité qu'elles n'ont pas lorsque le conduit est ouvert. Il en serait de même si le conduit de la trompe était fermé, d'ailleurs en pratiquant cette occlusion par la contraction des péristaphylins, on obtient un bruit analogue à celui qui se produit quand on bouche le conduit auditif externe.

M. Fournié réalise ces conditions au moyen d'un dispositif expérimental qui montre, en effet, l'usage isolant de la trompe.

Ce nouvel usage suppose donc la nécessité de la béance permanente de la trompe, mais comme la plupart des physiologistes et des auristes pensent au contraire que la trompe est habituellement fermée, et qu'elle ne s'ouvre que d'une manière intermittente sous l'influence des péristaphylins qui dès lors seraient des muscles dilatateurs, M. Fournié a dû démontrer par toutes sortes de preuves : 1°, que la trompe est habituellement ouverte ; 2°, qu'elle se ferme d'une manière intermittente sous l'influence de la contraction des péristaphylins qui, dès lors, sont des muscles constricteurs ou obturateurs.

Preuves anatomiques.—Par une coupe verticale pratiquée sur une trompe on peut s'assurer que le cartilage tubaire circonscrit un espace vide d'un millimètre de diamètre dans la partie la plus étroite. De plus, si on examine les rapports de la trompe avec les muscles on ne peut s'empêcher d'admettre que la contraction musculaire ne peut que comprimer, fermer la trompe.

Preuves physiologiques.—Si on remplit les poches gutturales d'un cheval avec un liquide coloré, et si on applique les excitateurs d'un appareil d'induction sur les parois de la poche, le liquide est projeté au dehors, preuve que les muscles qui agissent sur la trompe ont une action obturatrice.

Preuves physiques.—1°, au moyen de petites sondes ayant un conduit de 1 à 5 millimètres de diamètre, M. Fournié s'est assuré que les ondes sonores ne sont que très faiblement transmises quand le conduit n'a qu'un millimètre, par conséquent, les trompes ne transmettent pas les sons qui se produisent dans leur voisinage ; 2°, l'air ne circule pas à travers un tube capillaire fermé à un de ses bouts. M. Fournié le démontre au moyen d'un appareil dans lequel le gaz d'éclairage ne traverse le tube capillaire fermé à un bout qu'alors que ce dernier est transformé en tube ouvert aux deux bouts. Cette expérience prouve qu'il n'y a aucun danger que la poussée de l'air par la trompe ouverte vienne léser le tympan ; elle prouve aussi que l'air ne peut pénétrer dans la caisse à travers la trompe que s'il est poussé par une force assez grande. Cette force est représentée, sur le vivant, par la contraction des muscles péristaphylins qui ne peuvent être que des muscles obturateurs.

Preuves pathologiques.—De l'aveu de tous, une des causes les plus fréquentes de l'altération de l'ouïe est l'occlusion des trompes par un état inflammatoire ou catarrhal, et la conduite des médecins auristes repose sur ce fait quand il s'appliquent à rendre l'ouïe. Or, comment expliquer la genèse de l'altération de l'ouïe si on admet, avec le plus grand nombre, que les trompes sont habituellement fermées ? Il est vrai qu'on peut dire : dans l'état normal le renouvellement de l'air se fait par la contraction musculaire, tandis que dans l'état pathologique cette contraction ne suffit pas, d'où il suit que l'air de la caisse n'étant pas renouvelé, la raréfaction de l'air entraîne des désordres intra-tympaniques, qui sont la cause de

l'altération de l'ouïe. Si on admettait cette manière de voir on ne comprendrait pas que l'on puisse faire pénétrer de l'air dans la caisse par le catéthérisme alors que la contraction musculaire, beaucoup plus puissante que nos pompes ou poires de caoutchouc, serait incapable de le faire.

Conclusions.—1. La trompe est destinée à transformer la cavité close du tympan en cavité ouverte, dans le but d'empêcher les vibrations intérieures et extérieures d'arriver à trouver les parties solides dans une cavité close, et d'y provoquer une résonnance incompatible avec la bonté de l'ouïe.

2.—La trompe d'Eustache est toujours ouverte et la communication de l'air extérieur avec celui de la cavité du tympan est incessante.

3.—Le faisceau externe du pharyngo-staphylin, les péristaphylins interne et externe sont des obturateurs de la trompe d'Eustache et non des dilatateurs de ce conduit comme on le croit généralement.

4.—L'obturation de la trompe d'Eustache n'est jamais que momentanée—sauf dans les cas pathologiques—et elle se produit jour et nuit pendant les mouvements de déglutition, pendant la prononciation de certaines lettres, pendant le chant.

5.—Le circulus de l'air de la trompe et de la caisse du tympan représente une sorte de respiration dans laquelle les muscles obturateurs font office de forces expiratrices, tandis que l'élasticité propre du cartilage tubaire représente les forces inspiratrices.

DISCUSSION.

Dr. Thomas F. Rumbold, St. Louis: I believe that the function of the Eustachian tube is to allow air to pass continuously into the middle ear to supply the deficiency occasioned by the air being absorbed by the mucous membrane lining it and the mastoid cells, and that this supply is such as to cause a slight rarefaction of the air in the middle ear and the mastoid cells, consequently the air in the middle ear and mastoid cells is never equal in density to the air on the outside of the membrana tympani. This partially prohibitory action of the Eustachian tube is necessary to maintain a slight concavity of the external surface of the membrana tympani; and, as this slight concavity must be uniformly constant, it precludes the idea that the Eustachian tube is opened into the middle ear during the act of deglutition. There are quite a number of facts that prove that there must be a slight but uniform pressure on the manubrium; one is that every substance that is used as an artificial membrana tympani must be made to slightly press on the small bone, or on some of the ossicula, if this one is absent. Hearing depends upon the impingement, reception, and transmission of the sound waves by the membrana tympani, *viâ* the ossicula auditus and liquid in the internal ear, to the auditory nerve. To allow a uniform transmission of the nervous undulation to the auditory nerve, the membrana tympani must be in a uniform degree of tension. The relation between the tension of this membrane and its vibratory capacity is as much governed by physical laws as is the tension of a piano-string to give forth one uniform tone, or the convexity of a lens to converge a focus at a given point; neither of the three will allow of any deviation, yet we are asked to believe that this indispensable uniform condition can be maintained by an irregular act. A continuous air absorption necessitates a continuous renewal; either you must stop the continuous exhaustion, or you must allow a continuous supply. The alternative is physically unavoidable.

The Cotton Pellet as an Artificial Drumhead.

Dr. KNAPP, New York.

The *acoustic efficacy* of artificial drumheads, ever since their introduction, has been a matter of controversy into which I need not enter. Sure it is that some forms of artificial drumhead—for instance, Toynbee's rubber disc—so rarely yield results in any way commensurate with the amount of labour bestowed on their application, that the majority of aurists, no doubt, like the present speaker, have often thrown them away in disgust. On the other hand, however, there are patients whose hearing is so unexpectedly improved by an artificial drumhead that we are irresistibly forced to return to it. If there are cases, for instance, like that of the lady whose history I published in the *Archives of Otology* (vol. ix. p. 60, &c.), who from her sixth year could not hear more than loud words at the distance of one foot, but by means of moist cotton pellets could understand speech at the distance of 20 inches, and who has worn these pellets with the same advantage, and free from aural inflammation, these nine and twenty years—in fact, who cannot be without them. If such cases do occur, it is incumbent upon us to give this subject our careful attention. I have done this, I must shamefully confess, for the last year only; and yet in that brief space of time the results of my experiments have been so gratifying that I venture to speak of them even before you. The cases in which I have used the cotton pellet as an artificial drumhead with marked and substantial benefit have not been rare at all—I dare say at least one a week. The hearing was improved from $V=\frac{1-3}{60}$ to $\frac{15-20}{60}$; *i.e.* ordinary voice, which was understood only at the distance of from 1 to 3 inches, was by means of the pellet understood at 15 to 20 inches.

$V=\frac{20}{60}$ was the greatest hearing power to which I have thus far been able to raise a deaf person's hearing by means of an artificial drumhead. I must, therefore, consider this fraction, one-third of the normal standard, as the limit of the acoustical efficacy of the artificial drumhead. I have received equally good results from Dr. Blake's disc of sized paper, which was spread over old perforations in the membrana tympani. In this respect, as also in the use of the cotton pellet, my experience concurs with that of Dr. Burnett, of Philadelphia. I have not systematically tried the other forms of artificial drumhead. If $V=\frac{20}{60}$ is the limit of the acoustic efficacy of an artificial drumhead, it follows that for acoustic purposes it is indicated only in cases of greater impairment of hearing. If a person hears conversation still at 10 or 15 inches, he will not derive a great benefit from the artificial drumhead. The proper sphere of the little device are patients of $V=\frac{1}{60}$ to $\frac{5}{60}$; these are delighted with the improvement. If only one ear is hard of hearing, the services of an artificial drumhead are not conspicuous enough to be appreciated by the patient.

The *protective effect* of the cotton pellet is of utmost importance, as is exemplified, again, by the patient just quoted. Scarlet fever in her sixth year, copious and offensive discharge with repeated exacerbations of the chronic purulent otitis, and the hearing practically abolished until she was twelve years old; then judicious treatment for two months, after which the constant wearing of cotton pellets ever since, *i.e.*, for twenty-nine years, and, during all that time the secretion controlled, the hearing good enough to understand conversation across a room, and no more attacks of inflammation—a child of wealthy parents, who, before she wore the

artificial drumheads, lived like a deaf mute, and whose life was always threatened, afterward restored to health, usefulness, and all the enjoyments of refined society, a happy wife and mother; all this by the judicious wearing of little pellets of cotton, and whenever she leaves them off, she is to-day as deaf as she was in her childhood. Gentlemen, this shows the protective effect of the pellet to be as important as its acoustic effect, but it is at the same time so great a therapeutical result as would justify the envy of any branch of medicine, even of modest otology's proud sister, ophthalmology. It would be carrying coals to Newcastle if, at the present day, I attempted to explain in which manner the cotton pellet protects the ear; it is, of course, by keeping off the atmosphere with all its horrors.

In this lies also one part of its *curative importance*, but the other, less appreciated, because of being less efficient, before we had good absorbent cotton at our disposal, lies in its *action as a drain*. Drainage, gentlemen, is as essential and beneficial to an ear affected with chronic otitis purulenta as it is to a swamp. In both cases the stagnating fluid, decomposing and causing decomposition, infecting the mother soil, and all that it comes in contact with, must have a ready outlet as soon as it is secreted. You cannot constantly syringe an ear, and even syringing is only partially efficient, being unable to dislodge coagulated and inspissated substances, you cannot thoroughly and constantly wipe the tympanic cavity out, the very acts of syringing and wiping cause irritation and new secretion, which, mingling with the old decomposed parts in the recesses of the cavity, will soon become likewise infected. After cleansing a running ear by syringing and wiping, a wick of absorbent cotton, one end of which is pushed into the tympanic cavity, is an excellent drainage-tube. I direct the patient to renew it as often as it becomes moist, every two hours, or more rarely, three times or twice daily, according to the circumstances. Efficient, persevering and judicious cleansing will in most cases suffice to cure the otorrhœa; but it can, of course, be materially assisted by the local remedies, of which I prefer alcoholic solutions of astringents. Recent literature and several of my friends praise boracic acid powder.

When in this way the discharge is reduced, I give the cotton pellet more and more the shape of a wafer, impregnate it with a quarter per cent. solution of glycerine, and let it act both as an acoustical appliance and as a drainage-tube, for even in this form it still absorbes the serum in the cavity.

The *mechanism* of the artificial drumhead, you all know, has been abundantly discussed, and I shall not occupy your time in rehearsing the different theories. I think it is safe to say that in some cases it benefits hearing by tightening the chain of ossicles, in other cases by loosening it; in other words, and including these cases in which the ossicular chain is defective, by pressing the footplate of the stirrup inward, or in other cases drawing it outward. Pressure upon the upper part of the hammer, including the short process which lies just above the axis of rotation of the chain of ossicles, will diminish their tension, and act beneficially when the membrana tympani is relaxed or extensively destroyed. The tensor tympani muscle in such cases draws the tip of the handle powerfully and permanently toward the promontory, pressing the footplate of the stapes inward toward the labyrinth. In fact, A. Politzer, has been able to verify this theory by experiments. Some persons, showing the just-described conditions, heard better when, with a probe, he pressed upon the short process; but in other cases he produced an improvement of hearing by pressing upon the lower part of the manubrium.

That both these conditions, increase and diminution of tension, act prejudicially

on the function of hearing, is proven also by other facts—viz., in chronic otitis myringotomy and myringodectomy frequently cause considerable and immediate improvement of hearing, I think by tightening the chain of ossicles. Before the division of the drumhead the tough membrane was too powerful for the tensor tympani muscle, to keep the articular surfaces in proper apposition. In the same way an artificial drumhead may act by pressure, as has often been expressed. The improvement of hearing subsequent upon the division of the tendon of the tensor tympani muscle, which is reported, but upon which I have no personal experience, would act in relaxing the ossicular joints, analogous to the experiment of pressing upon the short process and upper part of the hammer. The conditions of both abnormally increased and abnormally diminished tension are those which invite our attention. Their mechanical influence upon the function of hearing, if possible to be ascertained in each particular case, may furnish indications for the application of an artificial drum-head, and of division of the membrana tympani and the tensor tympani muscle. A great deal, you know, has been said and done in this direction, and yet not enough.

Now, how are those cases to be explained, where the partial or entire covering of an old perforation, without secretion in the tympanum, increases the hearing at once and very considerably? Allow me an example.

Three months ago a lady came to me with chronic otorrhœa and impairment of hearing. The right ear showed an almost total destruction of the drum membrane. The ossicles were preserved. A moistened cotton pellet raised her hearing from V. $\frac{1}{60}$ to $\frac{20}{60}$.

In the left ear a thickened drumhead showed an old perforation of five or six mm. in diameter. I cut a piece of ordinary note paper so as to fit exactly upon the aperture. Hearing improved from V. $\frac{1}{60}$ to $\frac{20}{60}$. Patient delighted. I left the piece of paper in position for two weeks, and during all that time she heard well with that ear, while the pellet in the other had to be changed every day or every few days.

The explanation I offer in this and similar cases is as follows: The tight thickened and rigid drumhead loosened the ratchet joint between hammer and anvil, so that the sound waves, inpinging upon the defective and stiffened membrane, were insufficient to cause vibrations in the anvil and stirrup. But when the paper disc was spread over the defect, a larger surface, of which the paper part was in good condition of vibration, received the sound waves and the excursions of the membrane were now extensive enough to be given off from the hammer to the anvil.

So much upon the mechanical action of the artificial drumhead. Another, perhaps more important, effect of the cotton pellet is its influence upon the secretion of the tympanic cavity. We frequently find its aid to hearing most marked when the drum cavity is completely dry, in defects of the membrana tympani with sclerosis of the mucous membrane of the drum. In such cases the cotton pellet steeped in glycerine keeps the parts moist by stimulating secretion and preventing exsiccation from evaporation. On the other hand, in cases where there is too much secretion, a dry or only slightly moistened cotton pellet will act as an absorbent. In this way, by judicious use of the cotton pellet, we can keep the tympanum in the safest condition for the health of the patient, and the best for acoustic purposes. The action of the cotton pellet is therefore two-fold: (1) mechanical, (2) physiologico-therapeutical. The cotton pellet is found to be an essential help in that large group of cases of chronic otorrhœa which are so great an annoy-

ance to the patient and even a source of danger to his health and life, but which, when treated with perseverance, give the most satisfactory results. We must, however, take them in hand ourselves, not merely "prescribe" for them. Among all ear diseases they are those which I treat with predilection, because, being difficult to manage, they stimulate my own energy, and because, being dangerous, they demonstrate that the physician's work is of value. If the inflammation is cured and the deafness relieved by an artificial drumhead, these cases are for the aurist what cataract is for the oculist, whereas the chronic aural catarrh is at a line with amaurosis. In these, let the patient go home with a candid statement; in the others, indefatigable labour is a gratifying duty.

DISCUSSION.

Mr. CUMBERBATCH, London: The function of the stapes and effect of pressure on the fenestra ovalis are too imperfectly known for us to say for certain how the cotton wool pellet acts. I have been told by two patients that in course of years the artificial drum acts less and less and requires to be pressed harder in its place. I believe that the good effect of the artificial drum is produced by pressure on the stapes, but I find it acts best where the perforation is large.

Dr. CZARDA, Prague, showed a new artificial membrane, made of a disc of Lister's antiseptic silk. He at the same time exhibited a new pump syringe for the nose and ear, a new douche for the naso-pharyngeal cavity, a speculum, and a snare for polypi.

Mr. KEENE, London, showed a punched piece of linen which he used.

Dr. MACMILLAN, Hull: The satisfactory results of the application of pellets of cotton wool will depend much upon the condition of the lesion of the membrane, the condition of the ossicular chain and also of the middle ear. I have used them with success, and as you advance in restoring hearing, the cotton must be more condensed. I have used artificial membranes of different kinds of wool, with different results, and a small inflated bag has also been followed by improvement.

Dr. CASSELLS, Glasgow: The cotton wool pellet or so-called artificial drumhead I have used for many years back with the greatest success, as an aid to hearing, and as a therapeutic agent of great importance and value in many cases. As to its mode of action, I am of the same opinion as Dr. Knapp. I have never found it to lose its efficacy; on the contrary, in well-selected cases the patients could in a year or two give up using it, not needing it.

Objective Noises in the Ear.

Dr. C. E. FITZGERALD, Dublin.

The subject of objective noises in the ear* is one which has not, so far as I am aware, been treated of in any of the English text-books on otology; nor can I find

* By objective noise in the ear is meant a noise which is heard not only by the patient but by the surgeon also.

any case illustrative of this affection reported in British medical literature. I desire, then, to place on record three cases of objective noises in the ear, and I have endeavoured to collect all the hitherto published cases of this comparatively rare affection, so as to render the literature of the subject as complete as possible.

The first case is as follows :—

Anne B——, aged 32, a strong, healthy-looking young woman, presented herself at the Dispensary at the Richmond Hospital, on the 12th of February, 1875. She stated that when she was an infant she had had a discharge from the right ear, and that as long as she could recollect she had suffered from an almost constant noise in it, which was audible to bystanders. Her mother said she had noticed it since she was seven years old. Sometimes the noise ceased, and then she experienced a feeling "as if something fell into her throat," and that she was choking. When first subject to these attacks, she was perfectly cognizant of all that was going on around her; but latterly she had lost consciousness completely during them. While in this state, her hands are tightly clenched, and cannot be opened till the peculiar feeling leaves her throat; as soon as it does so, the noise again commences in her ear. Latterly she has had from four to five of these attacks generally every day. She had one in the train on her way up to Dublin, but she had not any since her arrival in the city.

On examination, a clicking sound was audible in the right ear, and could be distinctly heard at a distance of fifteen feet away from the patient. It was very regular, but was not synchronous with the heart beat. The hearing was defective in this ear; but unfortunately the exact amount of defect of acuteness was not noted. There was a large perforation in the membrana tympani, involving the lower and anterior segment. No movement could be detected in the handle of the malleus, or remaining portions of the membrane. On inspecting the oral cavity and pharynx, a remarkable rhythmical elevation and depression of the velum palati was observed, and this was found to be perfectly synchronous with the clicking sound in the ear. Air was now introduced into the tympanum by Politzer's method, and immediately both noise and movements ceased. It was afterwards found that this had always the effect of checking the noise and movements of the palate for a time. Pressure inwards with the fingers, behind the angle of the inferior maxilla, was attended with a similar result. The patient was admitted into the hospital, and ordered a mixture containing bromide of potassium. Unfortunately, the same evening, some accident cases were admitted into the ward she occupied, and she became so alarmed, that nothing would induce her to remain in the hospital. She continued, however, to attend the Extern Department for some time. The noise gradually became much less constant, being at times, absent for several hours. Though Politzer's method of inflating the tympanum succeeded in temporarily stopping the noise and palate movements, the patient could very generally reproduce them by making a forcible movement of deglutition. Sometime after the patient had ceased to attend regularly, she again visited the hospital, and described herself as greatly improved. She had then considerable intervals of freedom from the noise. Since that time I have lost sight of her. By a singular coincidence, on the very day following that on which this patient presented herself at the hospital, there appeared in the Philadelphia *Medical Times*, a paper by Dr. Charles Burnett, of that city, on a case of objective noises in ears, accompanied by spasmodic retraction of the membrana tympani and of the velum palati. Fortunately my colleague, Mr. Thomson, saw the journal on its arrival in this country, and kindly directed my attention to it. From this paper I obtained information

relative to the literature of this subject, and I was able to consult the majority of the references, as they were, with three exceptions, published in the *Archiv für Ohrenheilkunde.* Dr. Burnett's case, in the most essential particulars, closely resembled mine—viz., in the loudness of the noise, and the spasmodic movements of the palate. One very interesting point was ingeniously demonstrated by Dr. Burnett, namely, the movement of the membrana tympani during the spasms. He says:—

"At the first examination, Nov. 25, 1874, by simple inspection, I could detect no motion in the membrana tympani at each snapping; but in the course of a month, the thickening of the drumhead becoming less, I could detect at each snapping sound a very slight retraction of the drumhead at its antero-superior quadrant. Before I could thus see any motion in the drumhead by simple inspection, I placed a small glass manometer, devised by Politzer, with its capillary calibre, one millimètre in diameter, filled with coloured water into the meatus of the right ear, also filled with water, the two columns of water being hermetically joined by an india-rubber stopper on the manometer. The column of water thus brought into contact with the membrana tympani showed a negative fluctuation of one-half millimètre at each snapping sound, thus demonstrating a retraction of the membrana tympani, too small to be seen at that time by inspection, but since apparent upon close and attentive inspection."

In this case, the patient stated that "deglutition and rapid respiration increased the frequency of the snapping noise in the ear; but that, when he held his breath, the spasms (in the velum palati) and the snapping noise in the ear ceased entirely, to begin again with renewed respiratory acts." Dr. Burnett, by examination, confirmed this, and he also found that the sounds, but not the spasmodic elevations of the velum, could be arrested in two other ways. He writes:—"By throwing the patient's head back as far as he could get it, the spasms in the velum palati went on with the usual intervals; but neither the patient nor I could hear any snapping."

"I could also arrest the noise by pressing my finger firmly against the velum, and pushing it upward towards the pharyngeal opening of the right Eustachian tube; while I could still feel a powerful twitching with the usual intervals of repose of the muscular structures thus pressed, all snapping noise ceased."

"Pressure upon the left half of the velum palati, and mediately upon the pharyngeal opening of the left Eustachian tube, revealed no twitching in that region, nor did it influence in any way the spasms and noises on the opposite side of the pharynx and in the right ear."

As to the cause of this peculiar sound, the majority of the authorities appear to be now agreed that it is "due to a spasmodic contraction of the muscles of the velum palati, producing a sudden separation of the anterior from the posterior wall of the pharyngeal portion of the Eustachian tube."

Johannes Müller, who, I believe, could voluntarily produce a clicking sound in his ears, which was audible to others, taught that it was due to the contraction of the tensor tympani, and in the report of a case quite recently, by Bremer,* I see the latter adopts the same view. Dr. Holmes, of Chicago, who has also lately reported a case,† while admitting the separation of the walls of the Eustachian tubes as in some measure contributing to the production of the sound, says that a

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* *Monatschrift für Ohrenheilkunde*, Oct. 1879. (*The London Medical Record*, Feb. 15, 1880.)

† *Archives of Otology*, vol. viii. No. 2, p. 144. New York, July, 1879.

spasmodic contraction of the tensor tympani is possibly the "most important" factor. With reference to this point, it may be noted that Professor Moos, in the second volume of the *Archives of Ophthalmology and Otology*, 1871, has recorded a case of contraction of the left tensor tympani, synchronous with the act of mastication and accompanied by a loud grating noise. "This was heard very plainly without any instrument, near the patient, on movements of the lower jaw. The examination of membranæ tympanorum showed no material anomaly; on examination, while the patient was chewing, the left membrana tympani showed a to-and-fro movement." Nothing similar could be observed on the right side. The author makes the following remarks on this case:—

"The phenomenon is especially remarkable, because the result was confined to one side. If it had been observed on both sides it would have been less remarkable, as the muscles used in chewing and the tensor tympani receive their nerves from the same source. (On voluntary contraction of both tensores tympani, compare A Schapringer, "Transactions Austrian Acad. of Sciences," vol. lxii. sect. 2; October, 1870. Presented October 18th, 1870.) As is well known, Helmholtz first drew attention to the grating noise caused by violent concussions of the ear. He explains it by the striking together of the ratchet-teeth of the malleo-incudal joint. Politzer contests the correctness of this explanation from experiments of his own. According to him, the sound is derived from the whizzing noise of the membrana and the ligaments of the ossicula. Politzer could produce this whizzing in the ear of a corpse, even when the malleo-incudal joint was artificially anchylosed. *Wochenblatt der k. k. Gesellschaft der Aerzte*, No. 15, Vienna, 1870.)

On the other hand, in a report on the progress of otology, in the first half of the year 1878 (*Archives of Otology*, vol. viii. No. 2, July, 1879, New York), by Hartmann, there is a notice of a case of chronic spasms of tensor tympani muscle, without subjective sensations, recorded by Blau in the *Archiv für Ohrenheilkunde*, Bd. xiii. p. 261. The following appearances were observed:— "In variable succession, sometimes frequently or again more rarely, spasmodic motions of the membrana occurred; changes of the cone of light, or total retraction of the membrana, occurring 'with lightning rapidity,' were observed. There was no connection with respiration. The boy had no subjective sensations of the motions of his membrana tympani. The author considers the motions of the membrana tympani attributable to contractions of the tensor tympani muscle."

There is no mention of any objective noise, yet surely, if contraction of the tensor is capable of producing a noise, it ought to have been heard in this case.

The earliest recorded case of this peculiar affection which I can find is one referred to by Dr. Holmes in his remarks on the case already quoted;* "In 1854 I had an opportunity of examining a most interesting case under the care of Professor H. J. Bigelow, who had reported its history in the *Boston Medical and Surgical Journal*, November 3, 1847. In this patient, a young lady about sixteen years of age, the sound, a sharp "click" audible across the room, appeared to come from the throat. I have been informed by Professor Bigelow that this patient, and another similarly affected, who subsequently came under his observation, finally recovered. Unfortunately, when these patients were under observation, the rhinoscope was practically unknown."

This case appears to have been overlooked by the German authorities. Professor Schwartze of Halle, in the *Archiv für Ohrenheilkunde*, Bd. i. 1864, in a

* *Loc. cit.*

paper on "the Scientific Advancement in Aural Surgery during the last ten years" alludes to some experiments of Politzer's, which proved that the objective noise sometimes heard in the ear was due to the separation of the walls of the Eustachian tube. Politzer's view was simultaneously and independently enunciated by Luschka.

In same Archives (Bd. ii.) Schwartze subsequently published a case, in which the noise was synchronous with the movements of the palate. At the same time there was a sensible retraction of the membrana tympani which was most apparent at the extremity of the handle of the malleus. Von Tröltsch and Politzer appear to have established the fact that in persons who can voluntarily produce a noise in the ear, by elevating and depressing the palate, this movement of the manubrium also takes place. It is not difficult to understand this when we call to mind the tubal origin of the tensor tympani.

In the same volume of the Archives, Dr. Boeck, of Magdeburg, records a case which is also corroborative of the views of Politzer and Luschka. In this case there was a movement of the thyroid cartilage with each repetition of the sound. A rhinoscopic examination showed a separation of the anterior and posterior lips of the Eustachian tube with each elevation of the palate and thyroid cartilage. Curiously enough the noise in this case was synchronous with the pulse, but I am inclined to think this was merely a coincidence. If at any time the noise ceased, it could be at once reproduced by the act of swallowing. Dr. Boeck alludes to Funke's* explanation, namely, that it is due to the sudden stretching between the malleo-incudal joints, in fact analogous to what takes place when the fingers are suddenly and forcibly stretched. Dr. Boeck, however, who is an upholder of the views of Politzer and Luschka, argues that if this explanation be correct, the noise should also occur when air is injected into the tympanum. In this case the induced current proved of some benefit.

The next case is recorded by Politzer in the same Archives (Bd. iv. 26). It is that of a young person who in consequence of an acute tympanic catarrh, occurring during scarlatina, had a perforation of the membrana tympani. In this occasionally some secretion lodged, and during the act of yawning this was driven out through the perforation, thus proving the associated movement of the tensor tympani.

Politzer also gives some interesting notes of a case of voluntary contraction of the tensor tympani.

In the same volume of the Archives (Bd. iv. p. 229), Professor Schwartze reports two cases, and alludes to a case published by Leudet in the *Gazette Médicale de Paris*, 1869, No. 32, 35. He also speaks of an observation of Wreden's, who supposed that there might be in those cases a chronic spasm of the stapedius.

The first of Schwartze's cases presented the following features:

"A man aged between forty and fifty suffered from a loud cracking noise in both ears, which could be heard all round the room and was involuntary. At one time the snapping sounds followed each other rapidly but rhythmically, and then for a short time ceased. He had had the noise since he was twelve or sixteen years of age. He cannot reproduce it during a pause. It is much louder than the normal noise, which so many persons can produce. There is no movement of the membrana tympani. The noise is not synchronous with the pulse. There is a

* Funke, "Lehrbuch der Physiologie," Bd. ii. 113, 2te Auf.

movement of the palate, but none of the thyroid. The rhinoscope showed a narrowing of the pharyngeal openings of the tubes."

Schwartze alludes to the frequency in these cases of the power of reproducing these noises, during a pause, by swallowing. He expresses some doubt as to whether the noise in these cases has its origin in the Eustachian tube.

Case 2.—"A girl, aged five, for six months had complained of a snapping noise in both ears, which could be heard by a bystander at the distance of some inches. Before this noise began, a difficulty of hearing had existed for some time, but this had disappeared spontaneously. Latterly the child had frequently cried out on account of a violent pain in the ear. So far as the parents could determine there were no remains of the former deafness, nor could any pathological changes be detected in the membrana tympani. The snapping noise had a great resemblance to the cracking of the finger-nails. At times it ceased, and then again continued as regularly as the ticking of a watch. There was no movement inwards of the membrane visible, nor any sign of movement of the palate. The noise was not synchronous with the pulse, and could not during a pause be reproduced voluntarily by swallowing."

A rhinoscopic examination could not be made, on account of the narrowness of the naso-pharyngeal space. Relying upon the favourable accounts of Boeck and Politzer regarding the induced current, the author says it would seem applicable to such cases, but he states that as regards his own experience he had met with no permanent results from its use.

I believe Schapringer has recorded a case in the Reports of the Austrian Scientific Academy; but I have not been able to consult the reports, and so can give no account of it.

Dr. Küpper, in the *Archiv für Ohrenheilkunde* (N.F. Bd. i.), reports a case of chronic spasm of the muscles of deglutition. The patient, a man aged twenty, during an attack of measles suffered from a slight catarrh of the tubes and tympani from which he soon recovered. Immediately afterwards he had a constant naso-pharyngeal catarrh, and he complained of a peculiar noise in the ears, which was audible to any one standing close to the patient, and resembled the cracking of the finger-nails. Synchronously with the noise there was an upward movement of the thyroid, the floor of the cavity of the mouth, the root of the tongue, and the soft palate; the sides of the palate arched and approached; at times there occurred quick transitory spasms of the muscles of the eyes, nose, and mouth. The intensity of the sound varied; frequently it was scarcely audible when the ear was placed close to the patient, and frequently it was heard at a greater distance. The frequency varied likewise, 140 was reckoned in the minute, the rhythm was the same in both ears, and the intensity mostly the same also. Sometimes the noise ceased on one or both sides for a long time; the movements of the thyroid, &c., were always present. During sleep the noise was also audible, respiration and the frequency of the pulse had no connection with these phenomena. The hearing power for tones and noises was quite normal in both ears, no abnormality in the bone construction was present. The inspection of the membrana tympani revealed no change in its concavity. With the otoscope, when air was passed into the tube, a distant rustling noise was audible. The mucous membrane of the nose and pharynx was very red and swollen.

Dr. Küpper looks upon this form of spasm as due to a reflex spasm transferred from the sensitive nerves of the affected mucous membrane to the motor nerves. He compares it to the spasm of the orbicularis palpebrarum from a conjunctival affection.

As such spasm is frequently momentarily removed by pressure on a certain spot, so in this case by pressure on the root of the tongue the spasm was arrested, and lessened by pressure on the small occipital nerve, close to the insertion of the sterno-cleido-mastoid. The treatment consisted of local applications, astringents, gargles, catheterisation, baths, blisters, together with bromide of potassium, valerian, &c., and frequent use of the constant current; all with no good results.

Dr. E. L. Holmes reports a case in Knapp's *Archives* (vol. viii. part 2), of a seamstress, seventeen years of age, in whom there were involuntary spasmodic elevations of the larynx, as in swallowing, accompanied by a peculiar sound in each ear, distinctly audible at the distance of 18 inches from the patient on the left side, and 5 or 6 inches on the right side.

A similar sound could be produced by rubbing the edges of the thumb and finger-nails obliquely over each other. The sounds and the pharyngeal spasms occurred forty times in the minute, but remitted as regards intensity and intervals. Swallowing or holding the breath increased the distinctness of the sounds, which were lessened by colds in the head, without any increase of the slight deafness from which she suffered. The membranes moved slightly with each pharyngeal spasm, and were white and thickened in the centre and upper parts. Synchronous with spasm and sound, the velum rose, and the labii of the Eustachian orifices which were bathed in a thin muco-purulent fluid separated. Treatment with Fowler's solution, cod-liver oil, quinine and iron, for a twelvemonth, caused no beneficial effect.

In the same volume of the *Archives* is a notice of a case by Poorten, of a woman, aged forty-five, who suffered from beating in the left orbit, and a loud blowing noise in the left ear, audible at a distance of eight inches, and due to an aneurism in the left orbit following an injury.

In the *Archives* (vol. viii. part 4), there is a case recorded by Dr. Burnett, of Washington, of a gentleman, aged forty-four, who from childhood had been able to voluntarily produce a sound, referable to the ears, by a contraction of the muscles of the throat. The sound is a fine mucous râle, like the sound in the case reported by Dr. Holmes just noticed, and can be heard at 50 inches from the right ear, and at a somewhat less distance from the left. The production of the sound, while he is performing Valsalva's experiment, causes the air to pass with much greater freedom into the ears. He has not the power to produce it separately at each side. Dr. Burnett failed to detect any movement of the malleus, from which he inferred that the tensor tympani did not participate in the contraction. During the contraction the anterior wall of the pharyngeal orifice of the tube remained perfectly stationary, while the posterior lip moved forward and upward across the mouth of the tube, the edge sometimes reaching to the anterior border, completely closing it, but usually going only about two-thirds of the distance across. The uvula was at the same time drawn upward. The mouth of the tube was in a perfectly normal condition.

In the "Abstract of American Otological Literature" for the third quarter of 1879, published in Knapp's *Archives*, (vol. viii. part 4), a case is quoted which was reported by Mr. W. R. Amick. The patient, a woman of thirty, had first noticed snapping sounds after some fainting-fits when she was eighteen. They were loudest when she was excited, and could then be heard at a distance of 4 feet. A very slight movement of the membrana tympani is perceptible when the noise is loudest. There are about fifty-four sounds per minute, the pulse being 80, but there is no regularity about their occurrence. The cavity of the drum is

healthy, and the hearing normal. Mr. Amick considered the sounds to be tubal, but no mention is made of an examination of the mouth of the tube during the production of the noise.

In the *London Medical Record* of Feb. 15, I see the notice of a case reported by Dr. Bremer, in the *Archiv für Ohrenheilkunde*, Oct. 1879. The patient, a boy, had suffered from tinnitus for six months in the right ear The right membrana tympani was irregular and indrawn; the cone of light was absent, but in its place were several streaky or dotted reflexes. The membrane was transparent, and movable with the pneumatic speculum; there was slight pharyngeal catarrh. Hearing for Politzer's acoumeter was normal, general loud speaking was understood at from 15 to 20 feet. No noise was present at the time, but at a subsequent visit, a short, snapping, irregular noise was audible at a distance of 10 feet. It was repeated about 100 to 150 times per minute, and resembled the noise of a telegraph apparatus heard at a distance, or a noise produced by tapping the nails on oilcloth stretched over a table. It lasted about ten minutes, ceasing gradually, and was heard loudest in and under the right ear. The boy could produce and stop it at will. During its recurrence no movement in the muscles of the face, or in the drumhead could be seen, neither could any movement in the jaw or pharynx be detected, and it continued uninterrupted whilst a bougie was passed up the Eustachian tube. The author considers that it was probably due to contraction of the intrinsic muscles of the ear, especially the tensor tympani.

These are all the published cases I have been able to collect, and along with my own, the number is only seventeen. I can find no reference to the subject in any English work on otology, so that I presume it is fair to conclude that the affection is a rare one. I confess I find it hard to believe that the noise can be produced, as Müller and Bremer believe, by the contraction of the tensor tympani. It seems incredible that the contraction of such a minute muscle could be heard at a distance of ten, or as in my case of fifteen feet, whereas the absence of the palate movements occurring in only two of the cases is strongly in favour of the view that the sound is caused by the separation of the walls of the tube.

I now come to another form of objective noise in the ear, of which I have met with two well-marked examples.

The first case was briefly as follows:—

Mr. B. consulted me in November, 1878. He stated that about ten days previously he had noticed a pulsating noise in A. S. He did not observe it during the day-time, but as soon as he lay down in bed it became apparent. His wife could also hear it distinctly when she placed her ear near his. He enjoys good health as a rule, except that he is subject to indigestion. He has had a good deal of mental anxiety from hard work, being engaged in extensive business as a solicitor He had a brother who had died from the bursting of an aneurism, and consequently he felt some anxiety about this noise, thinking it might proceed from an aneurism. His hearing was perfectly normal on both sides, and the appearance of both ears and membranes quite healthy. On placing a stethoscope over the left meatus, a distinct pulsating, blowing sound could be heard. It was also audible on placing the stethoscope on the mastoid, immediately above the auricle. Pressure on the carotid stopped it, and it could not be heard till the patient assumed the recumbent posture. I prescribed fifteen m. of hydrobromic acid to be taken three times a day. Four days afterwards I again saw the patient, who stated that he was much better, and that the noise had decreased. Some days later I could not detect the noise, and I desired him to take the acid four times daily. In another week he was

very much better; the noise did not now, as before, prevent him sleeping. After this he again visited me, and described himself as suffering very much from dyspepsia, and stated that the noise had again returned with considerable intensity. He then consulted Dr. James Little for the constant dyspepsia from which he suffered; and meeting him some time afterwards, he informed me that the noise had almost, if not completely, disappeared.

The other case was that of a young lady who consulted me last October on account of a beating noise in the right ear. This had first commenced the previous Christmas, and had lasted for three months, after which it quite ceased. Six months before her visit to me it began again. By turning her head to the right side she could stop it. With the otoscope I could hear a distinct bruit of a blowing character in A. D., which was stopped by pressure on the carotid. The patient was distinctly chlorotic. Hearing and appearance of ear normal. Ordered hydrobromic acid. I then prescribed Bland's well-known sulphate of iron pills with the most marked beneficial results, for in time the noise completely disappeared.

In the *Transactions of the American Otological Society for* 1878 (vol. ii. part 2), Dr. J. Orne Green describes two cases of systolic murmurs in the ears controlled by pressure on the carotids. Both patients were of the male sex, and in both the membranes, Eustachian tubes, and throat were healthy. "In both there were certain abnormal conditions which were noticed when the sounds were present; in the boy the sounds were always complained of during and after general headaches, which could only be classed as nervous, as they came on after violent or exciting play, and were apparently independent of any digestive trouble. In the man, the sounds appeared just about the time he had begun to notice a loss of strength and appetite, when, in fact, there was some debility. One peculiarity in both cases is worthy of special mention; that is the extreme sensitiveness of the vaso-motor nervous system, as shown by the intense and rapid suffusion of the face on the slightest excitement or surprise—a condition to which both were subject, and which had been often noticed by their friends."

The boy recovered, but in the man's case the noise continued up to the date of publication.

In explanation of the occurrence of the phenomenon, Dr. Green seems inclined to accept that which Dr. Richardson gives as explanation of the subjective noises in the ear accompanying alcoholic dyspepsia.

"These are produced," he says, "by a reduced vascular tension, especially of the internal carotid artery, which allows the walls of the artery to lie in direct contact with the osseous walls of the canal in the petrous bone, and thus permits the transmission of the vibrations of the blood directly to the osseous structures in close connection with the ear. He does not speak of these vibrations as ever being heard objectively; but if his explanation is the true one, the noises are positive in contradistinction to the subjective irritations of the auditory nerve, which are purely sensational; and this being the case, the perception of the sounds objectively, *i.e.*, by another person, must merely depend upon their intensity. This explanation of Richardson's, it seems to me, is very possibly applicable to these two cases, for in both there were pathological states which could have induced a reduced vascular tension."

DISCUSSION.

Dr. Loewenberg, Paris: I agree with Dr. Fitzgerald in ascribing the noise to a palatal movement opening the Eustachian tube. I may remind my confrères the

proof of this fact is in the *Centralblatt* of 1863, where it is called a spastic noise, because it is provoked by a contraction of muscle.

The Sense of Touch as a Standard of Comparison for Hearing Power.

Mr. A. Gardiner Brown, London.

For examining auditory perceptivity the tuning-fork is to be preferred to the watch; among other reasons, because its pitch, being determinable, enables different observers to compare their results.

The Middle-C fork (= 256 v.s.) is, for this purpose, an excellent standard of pitch, corresponding as it does with about the middle of the compass of the human voice as used in conversation. When the "field of audition" (Knapp) is being determined, higher and lower pitches are made use of.

Hitherto the best way of employing a tuning-fork has been to strike it with a measured blow to ensure uniform amplitude of its vibrations, instantly applying it to the patient's head and noting the *duration* of his hearing-power (Magnus).

The author has now conceived the idea that the point in the lessening amplitude of the vibrations, corresponding with the moment of their loss to the sense of touch in the thumb and finger of the examiner, forms an excellent and convenient Standard of Reference for the auditory perceptivity of the patient.

Hearing-power, falling short of this point, the author has designated as *minus*, that exceeding it as *plus*, time being reckoned in half seconds (to save fractions), this may be done by means of a stop-watch, but the author prefers simple *counting* in half-seconds, easily and accurately done after a little practice; or the time may be estimated by a tubular sandglass, which he has had constructed for the purpose.

The most suitable points for ordinary examination are over the mastoid for bone conductivity, and at the focus of the concha for aërial sound-waves.

Example of use of Middle-C tuning-fork:

Case of P. S., aged 46, simple middle-ear catarrh (left side).

	Right ear.	Left ear.	Left ear (after Politzer's inflation).
Over mastoid . . .	+ 9	+ 13	+ 13
Focus of concha . .	+ 17	— 13	— 5

The dimensions of the "Standard" tuning-fork are:

Length of prong.	= 98·0 mm.
Width	= 7·0 „
Thickness	= 3·5 „

DISCUSSION.

Mr. Laidlaw Purves, London: How do you propose to estimate the pressure employed and the sensibility of the fingers of different observers?

Dr. Knapp, New York: I think that, as a personal test, the method may be quite reliable; but, as a general method, it is subject to the objection that different observers have different acuteness of feeling in their fingers. In testing the instrument with my neighbour in this room, I found an essential difference between his observations and mine. As a general acoumeter, I can fully recommend Politzer's

little hammer instrument. Four years ago I brought one of these instruments to New York. The different instrument makers made others so accurately resembling them that, even now, after very many artists of New York have used them for years, they still are, and act so much alike, that we are not able to distinguish the imitations from the original.

Mr. LAIDLAW PURVES, London: showed a method which he had employed for some time, by using an ordinary table as a sounding-board, or by applying two bodies to the mastoids of the patient, which were again connected with the mastoids, or the meatus, of the observer.

De l'Accommodation de l'Oreille: Retard de la Sensation—Etude Physio-pathologique.

M. GELLÉ, Paris.

Je laisse de côté les diverses phases de l'accommodation générale, telles que l'orientation, la recherche de la direction du son; j'ai montré dans des études précédentes comment se divise le champ de l'audition, l'isolement des sensations auditives latérales, et le rôle du pavillon dans cette fonction.

L'accommodation au ton ou au timbre existe-t-elle autrement que par les dispositions anatomiques du limaçon pour celui-ci, de la membrane du tympan pour l'autre? ce n'est pas ma thèse. Je veux traiter de l'accommodation au point de vue unique de l'intensité du son, par conséquent de la portée de l'ouïe.

On sait combien les variations de tension de la membrane ont d'action sur la portée de l'ouïe; que le son soit apporté par l'air, ou par les os du crâne, il est atténué quand on tend artificiellement la cloison (pression ou insufflation d'air). L'appareil d'accommodation constitué par la chaîne des osselets et ses muscles moteurs n'a pas d'autre fonction que de modifier l'état de conductibilité du tympan et de l'appareil de transmission. Rappelons aussi combien sont limités en dedans les mouvements de déplacement du tympan et de combien peu sa tension doit varier pour s'accommoder du grave à l'aigu.

La maladie agit d'une façon bien plus brutale sur la tension du tympan; tantôt elle le rend plus mou, le détend, l'allonge, tantôt elle le sèche, le durcit, l'épaissit, l'immobilise. Ces modifications tiennent à des lésions soit de la chaîne, soit de ses muscles, soit de la cloison elle-même.

Je laisse de côté ici les lésions labyrinthiques capables de modifier l'audition de certains sons isolément, ce qui les indique assez nettement du reste.

J'ai cherché à étudier les modifications de la conductibilité de l'organe de l'ouïe sous l'influence des lésions précédentes.

Je me sers pour produire les tons graves ou aigus de diapasons actionnés par un courant de pile; et le son est transmis à l'oreille par un téléphone, et gradué dans son intensité au moyen de la bobine à chariot.

Dans une première série d'observations, la lésion cause était bien nette, c'était un ramollissement avec détente du tympan. L'audition reparaissait très bien à la première insufflation d'air, qui tendait passivement la membrane, pour les sons aigus surtout. Dans les cas où le tympan est très enfoncé, tendu par la rétraction de la chaîne et des ligaments par des brides interposées, et peu mobile même à la

douche d'air, c'est l'audition de sons graves qui laisse à désirer, on assiste aux efforts d'attention des patients. Toutes ces lésions modifient la portée de l'ouïe et altèrent la perception des sons d'intensités diverses.

L'organe ne peut plus s'accommoder. Au moyen du dispositif précédemment indiqué, j'ai pu étudier ce défaut d'accommodation dans des cas où l'ouïe n'était pas complétement éteinte.

Dans un premier examen, on note la limite extrême de l'audition pour un son donné; puis on replace le chariot; on fait entendre un premier son fort; et, éloignant brusquement la bobine, de façon à fournir le même son, mais très affaibli, on constate si la sensation a été continue, ou s'il y a eu interruption dans le courant sonore après cette modification d'intensité du son. A l'état normal, il n'y a pas d'interruption du son, il faiblit, mais on n'a pas cessé un seul moment de l'entendre.

Dans les cas pathologiques de l'ordre que j'indique un phénomène curieux se passe: il y a un temps de silence; le sujet n'entend plus rien, et s'en étonne; c'est lui le plus souvent qui l'annonce, puis, qui reconnaît ensuite tardivement le son très affaibli. On compte avec intérêt le temps très sensible qui s'écoule entre le déplacement de la bobine et le moment où le sujet déclare entendre de nouveau. J'ai compté 10, 25, 30 secondes de retard dans la transmission du son.

Le phénomène ne peut s'expliquer que par un retard de l'accommodation. Il ne s'agit pas là d'une absorption du son par une impression trop vive, étourdissante; il y a silence. Que se passe-t-il pendant cette phase silencieuse?

C'est sans doute un travail, ou un essai de travail d'adoptation de l'organe à la sensation nouvelle.

Pourquoi donc est-il aussi lent, et aussi difficile?

Il suffit d'avoir vu une pièce pathologique d'ancienne otite indurée pour comprendre cela. Grâce à l'enfonçure du tympan et de tout l'appareil, grâce à la raideur générale, à la propulsion en dedans du manche et de l'étrier, la course qu'il peut fournir en dedans se trouve accomplie; il ne peut obéir davantage à l'action du tenseur, de plus celle-ci est amoindrie par l'atrophie quelquefois. Si le tympan est seulement ramolli et enfoncé sans rien aux osselets que le susdit déplacement en dedans l'action est analogue; le tendon du tenseur se trouve détendu, il est trop long pour agir normalement, enfin la moindre contraction achève d'enfoncer l'étrier dans le labyrinthe. Dans ce cas, si l'on donne un peu de champ aux parties par une insufflation d'air, par exemple (ceci vu sur les pièces fraîches), on s'aperçoit que le labyrinthe recommence à subir les oscillations de la platine, à peine visibles auparavant.

C'est cette incapacité fonctionnelle qui cause le retard de la sensation et explique la lenteur, l'insuffisance et souvent la nullité de l'accommodation.

Mais, il n'est pas besoin de graves lésions de l'organe pour constater le phénomène du retard de l'accommodation; un de mes malades très intelligent entendait la montre à 50 centimètres et mal la voix parlée. Il avait un retard manifeste et très sensible pour lui-même. C'était donc bien les variations brusques de l'intensité qui mettaient son organe en défaut.

En allant doucement dans la diminution de la force du son il n'y a pas d'arrêt dans l'audition.

Cela semble rendre compte de ces faits curieux, notés par tous les observateurs, où l'audition de la parole est mauvaise, où le sujet fait répéter tandis qu'il entend le son du diapason et de la montre et la musique à une distance remarquable. La parole est en effet composée de sons rapides et d'intensités diverses. J'ai été con-

firmé dans ces idées et dans cette interprétation des faits, par l'examen d'oreilles de sujets atteints de paralysie faciale sans lésion tangible sérieuse de l'oreille moyenne, ou après la disparition du processus initial; alors c'est le moteur de la chaine, le tenseur tympanique, qui n'ayant plus d'antagoniste ne peut graduer son action et dépasse le but.

Cela nuit à l'accommodation de l'organe auditif et pour la parole surtout.

Il est possible de juger du retard apporté à l'accommodation avec mon appareil à courant; or, ce phénomène apparaît ici avec une grande intensité; sur un de mes malades, il fallut près d'une minute pour qu'il pût s'accommoder; et que le son faible fut perçu. J'ai calculé un intervalle de plus d'une minute entre le moment où je bouge la bobine de place et celui où le sujet annonce entendre.

Au reste le malade se rend parfaitement compte de ce temps perdu, de l'interruption de la sensation et de sa reprise tardive.

On comprend bien ainsi que la parole soit mal entendue alors que la musique et le diapason et la montre n'ont pas cessé d'être perçus à une portée excellente.

Paretic Deafness.

Dr. Edward Woakes, London.

Amongst the forms of deafness which are unattended with any marked objective conditions when the ear is externally inspected, that which I have called "Paretic" deafness constitutes an important group. Having already discussed the subject elsewhere at considerable length, I propose now simply to summarize the salient features of the disease.

Symptoms.—These usually commence without any cause which the patient can associate with his ears: very frequently the symptom which first attracts attention is some degree of tinnitus in one or both ears. He then finds he is deaf, but vertigo is nearly always absent. As regards the degree of deafness, this is liable to frequent variations in the direction of improvement, followed by relapses; it is worse at night, and after fatigue, whether mental or physical. There is but slight tendency to pass beyond the point at which it first attracted notice, subject, however, to the variations mentioned above. Occasionally there is no deafness, but tinnitus only.

The objective symptoms are contributed by the palate, which presents varying degrees of loss of muscle power. This is shown by the obliteration of the anterior arch of the palate, on one or both sides, so that the soft palate droops and hangs at a lower level than in the normal state. In bilateral paresis, owing to this circumstance, the uvula is lost sight of until the tongue is strongly depressed. In unilateral paresis, which is most common on the left side, and corresponds to the affected ear, the uvula is occasionally drawn to the sound side. The irritability of the muscular contingent of the velum—*i.e.*, its capacity to respond to stimuli, does not always correspond with the indications of paresis above described; while at times it is quite insensitive, remaining passive when touched, and even roughly handled; in other cases it moves freely under these circumstances. The significance to the deafness of this wiping out of the superior and anterior arch of the palate resides in the relationships of the tensor palati muscle to the organ of hearing. The complicated character of these relationships was first pointed out by Weber-Liel, whose work in this department is simply unique. In the necessarily brief

allusion which I can now make to this subject, it must suffice to point out that a portion of the tensor palati is attached to the fascia of the Eustachian tube, which fascia has intimate connections with the tensor tympani muscle throughout its entire length. This fact seems to me to necessitate the conclusion that any loss of power in the palate muscle will disturb the *point d'appui* from which the tympanic muscle acts. The physiological function of the latter is to regulate the conducting power of the ossicle for sound waves, so that the impression conveyed to the perceptive apparatus may correspond to that of the original impression received by the drumhead. The sensitiveness of the tympanic muscle which is mainly concerned in this process may be readily conceived, and its liability to derangement must be proportionately great. It is obvious, therefore, that any loss of power in the palate muscle, such as is indicated by its inability to support the superior arch of the velum, will materially interfere with the stability of the fulcrum from which the tympanic muscle acts.

But, further, the tensor palati, being a dilator of the tube, though not the only muscle subserving this end, its paresis will modify the admission of air into the middle ear.

Another consideration arises out of the identity of nerve supply of the two muscles in question—viz., from the otic ganglion. As will be shortly pointed out, there is good reason to believe that the ganglionic centres are themselves the frequent seats of defective nerve influence, and supposing such a paresis of the otic ganglion to obtain in the cases under review—to be, in fact, the starting point of the lesion—it is fair to infer from the palate paresis which we can see, a similar loss of power in the tympanic muscle, receiving its nerve supply from the same source. That is to say, we infer the existence of paresis of the tensor tympani when we see its congener of the palate to be in that state. This assumption is fortified by the flat and relaxed appearance of the drumhead when viewed from the meatus.

Thus otic ganglionic paresis is seen to necessitate deficient ventilation of the middle ear—though not complete suspension of this function, because the remaining tubal muscles which supplement it are not implicated, having a distinct innervation on the one hand; and on the other, defective accommodation power of the drumhead. These two conditions explain the deafness, and also account for the slight objective indications which the subjects of paretic deafness afford upon inspection of their ears.

Etiology of Paretic Deafness.—Passing to the causes which give rise to this form of deafness, these will be seen to be exactly those which impair the vitality of the subject. In one of its aspects it may be regarded as the tribute of our over-wrought civilization to the domain of otology. Thus the effects of mental wear and tear, especially the nervous tension and worry consequent upon competition in the modern race for wealth, tell largely upon the energy capable of being exerted by the nutritional nerve centres. Certain habits, however pleasant in themselves, tend undoubtedly to localize the nervous exhaustion in the centres of the head and neck, such, *e.g.* as tobacco-smoking, must be included in this category. Sudden shocks to the system generally belong to it, and amongst my patients, affording examples of this cause, has been one who lost much blood from the accidental division of an artery in the wrist, and another who was suddenly immersed in the water while skating.

It is especially the phase of deafness initiated in women during the period of activity of the reproductive function, the over exercise of which activity, to the

great detriment of the wife's constitution, is a glaring defect in our pretentious system of modern domestic life. Indeed, that woman may be considered happy, who, in the exercise of her marital relationship, escapes with the annoyance of deafness only, consequent upon the exhaustion of her ganglionic nerve force in the rapid reproduction of her species. That I am not alone in the opinion just expressed, is proved by the evidence of Weber-Liel, who recognises the causes I am referring to as constantly operative in inducing the allied phase of ear disease, described by him as "progressive" deafness.

Though usually affecting the well-to-do classes, such a combination of circumstances may happen, as cause the appearance of Paretic deafness in the lower ranks of life—when, for example, as in the winter of 1877-78, there occurred a prolonged period of severe and exhausting cold weather, coupled with wide-spread poverty, due to commercial depression, and affecting large masses of the community. It was after this winter that there occurred among my out patients at the throat hospital, a considerable number who presented paresis of the palate, and who concurrently complained of deafness, that my attention was called to this aspect of ear disease.

Differential Diagnosis.—The chief characteristics which differentiate paretic deafness from progressive deafness, to which it has some affinities, have been already hinted at. They are, first, the almost negative condition of the membrana tympani. What slight departure from the normal state can be detected is seen chiefly in the modification of the cone of light, which may be truncated towards its apex at the umbo, causing it to appear smaller than it usually does in the healthy drumhead. This may be accepted as indicating a slight degree of change in the natural curvature of the part—it is flatter than in health. Whereas, in progressive deafness, one sees a marked indrawing of the membrane, especially in its anterior segment, with abnormal prominence of the manub. mallei, and of the proc. brevis. Other differences are the non-progressive character of the deafness, and the absence of giddiness, as well as the greater curability of the disease in the paretic form.

Referring to the identical point of departure in these two phases of ear disease —paresis of the tensor muscle of the palate—the question naturally arises whether any grounds exist by which to account for the distinctive action of the tensor tympani muscle exhibited in them. It does not appear that Weber-Liel in his affection considers the latter muscle as primarily affected, but, regarding it as antagonistic in its action to the tensor veli, its behaviour is dictated by removal of this counterpoise. It may thus be said to have the field to itself, and to become spasmodically contracted in consequence. Perhaps, however, this divarication of the state of the muscles is better explained by the causes which primarily induce the lesion. In paretic deafness these are rather of the nature of a sudden shock, or its equivalent, taking effect upon a part of least resistance, and resulting in an equal loss of power in both muscles—while Weber-Liel's disease appears to arise from a more chronic impairment of nerve supply consequent upon the gradual inroads of disease, usually catarrhal in its origin.

Most of the foregoing features will recur in the details of the following cases :—

Case 1.—Mrs. ——, a widow lady, aged 38, seen in April, 1881. She states that eighteen months ago she received an incised wound of the wrist which severed an artery, and that she lost a great deal of blood. Since then has had ringing noises in right ear, extending over the side of the head. She is not deaf, nor is she subject to giddiness. On testing the hearing power with the voice and watch, this was shown to be normal. M.t.t. normal, except that on the right side the bright spot was

smaller than on the left. There were constant tidal noises in the right ear, and the Eustachian tube on that side did not admit air. There was marked bilateral paresis of the palate, but no catarrh of the pharynx or post-nasal region.

She was given a pill containing iron, quinine, and strychnine, and the catheter was introduced every week. She improved rapidly in health, the palate resumed its normal condition, she shortly became able to perform Valsalva's process: the noises also gradually abated. In five weeks she was quite well. I have seen this lady recently, and she remains free from tinnitus.

This patient was fortunate in getting treatment before the impairment of the tubal function had produced deafness, for though catheterization was not at first successful, it is certain that air must have entered the middle ear to some extent, or more objective conditions would have been apparent in the drumhead. Perhaps the circumstance that this lady had only one child favoured the rapid recuperation of her constitutional debility, consequent upon the accident, when placed under treatment calculated to reinstate it.

Case 2.—Mrs. ——, aged 24, a delicate-looking lady, seen in the spring of this year. She states that after her second confinement, fifteen months previously, she experienced noises in her right ear, with some diminution in hearing power, though, as she said, this had not been noticed by her friends. The deafness was worse at night.

On examination, the hearing power, which was very good, for the voice gave with the watch ¼ in 40 for the right, and 7-40 for left ear. There was no vertigo but constant tidal sound in the right ear. M.t t. flat with very diminished bright spot, but no prominence of manub. or of processus brevis. Right Eust. tube obstructed, left patent. The soft palate was anæmic and thin, it exhibited double paresis in a marked degree. There were no other abnormal conditions present.

The treatment was similar to the preceding case, and was attended with a like improvement as regards tinnitus. The faradic current was applied three or four times to the palate. She left to visit the Continent at the end of six weeks, at which time the hearing power for the watch had improved to the extent of two inches only. The noises were imperceptible except occasionally after exertion.

The cases just quoted are sufficiently typical to illustrate the character of the disease under review. Having already published several others, it is needless to occupy your time by multiplying them on this occasion. It is necessary, however, to remark, that the paretic symptoms are occasionally overlapped by others due to catarrh, and unless the observer be prepared to recognize the palate signs which bear evidence of the existence of paresis, the catarrhal state of the naso-pharyngeal space may monopolize his attention. The result will then be a partial improvement only; one, that is, which is not equivalent to what the case is capable of attaining to under other circumstances.

In conclusion, I beg to submit that the phase of "paretic deafness" described above, in which objective signs in the outer ear are almost nil—is of sufficiently frequent occurrence to justify the distinctive term I have applied to it. And I would fain hope that its recognition will prove a distinct aid to the differential diagnosis of the causes of ear disease.

The Action of Syphilis on the Ear.

Dr. F. M. Pierce, Manchester.

The effects of congenital and acquired syphilis on the ear less observed than its effects on the eye, teeth, skin, &c.

Syphilitic ear affections analogous to corneo-iritis and amaurosis.

The signs and symptoms of syphilitic aural affections must be considered together with the history and collateral signs of syphilis and the failure of anti-catarrhal treatment to relieve apparent catarrhal symptoms.

Are the obstinately relieved symptoms of aural syphilis due to a periostitis of the parts, or to a proliferous form of inflammation of the mucous membranes concerned? If the former, affections of the bones (mastoid, petrous, and temporal) with inner ear implication, should preponderate over middle ear catarrhs.

Primary sores of the ear are very rare; secondary squamous, pustular, and papular eruptions are common. (Cases quoted.)

The evidence of syphilis attacking the middle ear is mainly of a catarrhal character, with a marked prevalence of anomalous auditory nerve symptoms, and, in adults, these symptoms are suggestive of acquired or congenital syphilis as a predisposing cause.

(Forty cases of acquired syphilis affecting the ear referred to.)

Congenital syphilis manifested from 11 to 18 years as average.

Most frequent in females, as 4 to 1.

Access of deafness, gradual but rapid: in from three weeks to one year. About period of puberty in females, rather later in males.

The membrana tympani dull, pearly opacity, collapsed, the light spot large and dull and the manubrium of malleus red, flat, and retracted. The meatus dry and polished. The nasal passage swollen, and seat of chronic thickening and discharge.

The deafness generally preceded by specific chronic interstitial keratitis, recovery from which is signal for accession of extreme deafness of a very intractable character. The early decay of the characteristic teeth of congenital syphilis produces frequent earache.

(The effects of congenital syphilis of the ear have been noticed in thirty-five cases.)

As a summary of the characteristics of acquired and congenital syphilis affecting the ear, we see—

1.—Extreme degree of deafness manifested early in the progress of the disease.

2.—Rapidity of progress and absence of pain.

3.—Early and extreme loss of hearing for the tuning-fork over the vertex.

4.—Frequent imperviousness of both Eustachian tubes.

5.—Constancy of the tinnitus, of a hissing kind.

6.—Frequency of simultaneous inner ear symptoms.

7.—Improvement of pre- or co-existing eye affection.

8.—More decided affection of the naso-pharnyx than in catarrhal ear disease.

9.—Less complete recovery than in simple catarrh.

Intolerance of sound, like that of light in syphilitic eye affections, is not a noticeable feature in syphilitic ear affections.

If most syphilitic ear affections are due to inflammation of the periosteum of the petrous and temporal bones, how can we explain the rapid loss of auditory nerve power, which is usually of slow occurrence in such cases?

Caseous Accumulations in the Middle Ear, regarded as a Probable Cause of Miliary Tubercle.

Dr. Thomas Barr, Glasgow.

At the recent discussion on the Pathology of Phthisis and Tuberculosis held by the Glasgow Pathological Society, I ventured to make a suggestion as to a possible source of tubercular infection to which hitherto but little attention had been directed. At that discussion, the question of the tubercular infection of the system by a virus arising from the softening of caseous deposits, the results of an antecedent inflammatory process, was one of the points most keenly discussed. The frequent coincidence of caseous deposits with miliary tubercles is admitted by all; but our enthusiastic advocates of the doctrine of self-infection have to admit that careful examination of the body after death sometimes fails to discover any such caseous source of infection, and the failure to discover such a focus, even in a few cases, strikes a serious blow at the doctrine of self-infection, as taught in the absolute manner of Buhl, Virchow, Niemeyer and others in Germany, and by Dr. Hamilton in this country.

The object of this paper is first, to draw special attention to a part of the body almost invariably neglected by the pathological anatomist, where the conditions for the production of caseated products exist, probably more frequently than in any other part of the body; and, secondly, to inquire whether the local form of tuberculous meningitis may not frequently be the result of the absorption by the lymphatic vessels of softened caseous matter formed in the ear.

I shall first show that, in the osseous cavities of the middle ear, catarrhal products are very frequently formed under conditions which favour, in a remarkable manner, their prolonged retention, stagnation, drying, and caseation.

The middle ear is more spacious than is generally supposed. It includes the Eustachian tube, tympanum, antrum mastoideum, and mastoid cells. The antrum mastoideum is generally looked upon as one of the mastoid cells, but it is so considerable in size, and so important in its pathological relations, that it has received a distinctive name. It is always well developed, and even in the young child, when the other mastoid cells are represented only by porous bone, this cavity is constantly found, and is often as large as a cherry-stone. While under the influence of purulent collections, it often enlarges very considerably. The mastoid cells proper form an exetnsive series of larger and smaller air-filled cavities. They are not limited, as is often assumed, to the mastoid part of the temporal bone, but are found scattered through the greater part of the temporal bone, extending inwards as far as the apex of the petrous part of the bone, and outwards as far as to the root of the zygoma.

The inner surfaces of these hollow spaces are lined by mucous membrane, which is probably more liable to catarrhal and inflammatory processes than any other mucous membrane in the body. The most frequent kind of catarrhal process to which this mucous membrane is subject is, undoubtedly, that attended by fluid exudation. Out of 1,000 consecutive cases of ear disease, the records of which I have preserved, 400 consisted of chronic purulent inflammation of the middle ear and its consequences, while a considerable number consisted of acute purulent and mucous collections in the middle ear. Then of these 400 cases, in 140 the disease existed on both sides.

The exudation in the middle ear in these exudative diseases varies in composition and consistence according to the degree and character of the inflammatory process. In the severe and acute forms of inflammation, it is purulent, and contains chiefly pus corpuscles, or the pus may be mingled with a considerable quantity of mucus. Or the exudation may consist of a thin serous fluid containing few pus corpuscles or epithelial cells. Or, again, it may consist of thick, viscid mucus, containing a large quantity of mucous corpuscles, some pus corpuscles and exfoliated epithelial cells. Mixed with all of these there may be blood corpuscles in greater or smaller number.

We have now seen, 1st, that we have, in the middle ear, an extensive series of enclosed spaces capable of containing a considerable quantity of material; and, 2nd, that these spaces are very frequently the seat of catarrhal affections with copious mucous, serous, and purulent formation, as well as of epithelial proliferation.

I must now point out that there are circumstances or conditions which favour, in a remarkable manner, the retention, drying, and ultimate caseation of these inflammatory products in the middle ear.

1st.—The structural peculiarities of the middle ear are such that there is a great tendency to the retention of secretions in the middle ear, especially in the antrum mastoideum and mastoid cells. The position of the outlet to these parts is very unfavourable to the spontaneous escape of their contents. We all know how important it is that the opening in an abscess should be in a dependent situation, in order to ensure the thorough evacuation of the contents of the abscess. The opening provided by nature for the escape of secretions in the mastoid cells and antrum mastoideum is situated above the level of these spaces. More than that, the situation of this orifice is such, that secretions formed and contained in the tympanum are very apt to flow from the tympanic cavity into the antrum mastoideum, and thence into the mastoid cells, when the patient is lying on his back in bed. The outlet by which secretion in the tympanum may escape outwards is situated near to the roof of that cavity. Generally, however, a perforation in the tympanic membrane is the means by which secretion escapes from the tympanum, and this perforation is always above the floor of the tympanum. The outlets, therefore, provided by nature for the removal of exudations in the middle ear must, by the ordinary laws of gravity, be ineffective. Again, pathological changes in the middle ear, consequent upon catarrhal affections, often prove serious hindrances to the passage outwards of secretions formed in the deep parts of the middle ear. Such obstructions are often formed, for example, by adhesions of the tympanic membrane to various parts of the walls and contents of the tympanum, by the plugging of the outlets by polypi, or by inspissated pus or mucus.

Unfortunately, also, in very many cases, no efforts are made to wash out the muco-purulent or purulent masses, so that these very frequently lie in the interior of the ear, undisturbed by treatment, for months or years, and only the overflow as we might say, escapes by a hole in the tympanic membrane, or by a fistulous opening in the cortical part of the mastoid cells.

It is therefore clear, I think, that inflammatory products formed in the cavities of the middle ear are very likely to accumulate, and to be retained for an indefinite time. These cavities of the middle ear may thus be looked upon as frequent storehouses for inflammatory products.

The question now presents itself, "What becomes of these inflammatory products thus confined in the ear?" In a considerable number of cases, especially in

the mucous and serous varieties, the process of absorption, either spontaneously or by the aid of treatment, removes them before they become inspissated.

But the collections of muco-purulent or purulent products have usually a longer history, as the large proportion of chronic purulent cases in my 1,000 cases of ear disease shows. We must, of course, exclude those cases in which the morbid process has been limited to the readily accessible part of the tympanum, and where the opening in the membrane has been sufficient to give free exit to the secretion. In such cases, which are usually readily cured, nothing more than local injury to the organ is likely to ensue. We must also exclude those cases where, by the aid of appropriate treatment, the inflammatory products have been effectively cleared out of the upper part of the tympanum and the antrum mastoideum, and the secreting process stopped. This is a desirable result which might be gained in a large number of cases, if such cases were brought under treatment. Excluding all those in which such favourable terminations are happily attained, there is a large number left, in which, if no other fatal complication, such as pyæmia, supervene, the accumulated inflammatory products in course of time inspissate, and become converted into cheesy masses. This change is most likely to take place after the active secreting process has ceased in the seat of the collection. These cheesy masses may remain, and probably often do remain, in the inaccessible parts of the ear for a life-time without provoking any disturbance of the organism. But is it not possible that they may at any time soften, and then, becoming absorbed by the blood-vessels or lymphatics, they may constitute the virus which reveals itself in a general tuberculosis or in a local tubercular meningitis?

Just as the presence of decomposing purulent matter does not always produce pyæmia or septicæmia, so the presence of caseous collections in the cavities of the ear excites tubercular disease only in certain persons or under certain conditions. Dr. Hamilton says the caseous matter must soften before the virus is elaborated. According to Cohnheim's view, the caseous matter is converted into tubercular matter by the action of certain particles from the air, and then absorbed, just as bacteria from the air acting upon pus convert it into a virus which when absorbed produces septicæmia. In any case, when caseation takes place the absorption of the caseous matter is more likely to take place in scrofulous individuals. It has been said that tuberculosis is built up almost without exception upon scrofula as a basis, and that scrofula is one of the chief etiological factors in tuberculosis of the pia mater. Probably the absorption of the caseous matter converts scrofula into tuberculosis.

Apart from this, we may reasonably conjecture that all conditions or circumstances which tend to depress the vitality will add to the danger of these collections, such as bad hygienic conditions, the irritation of dentition, diarrhœas, colds, badly ventilated apartments, improper food, especially infants fed through the bottle. In these circumstances we may suppose that, with cheesy collections in the ear, a child is more exposed to tuberculosis of the pia mater than a child brought up under more propitious circumstances.

Having seen how the peculiar structure and conditions of the middle ear make it a probable source of tuberculosis, through the absorption of caseous matter collected there, I have now to inquire whether tubercular meningitis, of the child especially, may not frequently have its source in caseous collections in the middle ear. Exudative catarrhs of the middle ear are extremely frequent in children. Associated in their origin, as these conditions of the ear frequently are, with exanthematous diseases, their frequency in childhood might be expected. Of the

400 cases of chronic purulent disease of the middle ear which I have already referred to, in no less than 320 the diseased process had begun at an age under fifteen years. But the frequency with which such cases come under the notice of the family medical attendant, or of the aural specialist, does not fully or correctly represent their actual frequency. Thus, of 24 unselected children, under 3½ years, whose temporal bones were examined after death by Von Tröltsch, the middle ear was found normal in only 9, or in 38 %. In fifteen of these there was a collection of pus and mucus in the tympanum and antrum mastoideum, without any perforation of the membrane. Of eighty children examined by Wreden, of St. Petersburg, the middle ear was found normal in only 17½ %; and again, of 300 children examined by Kutzchariany, of Moscow, the middle ear was found normal in only 25 %. Now we all know that tubercular meningitis is pre-eminently a disease of early life. Is there any causal connection between the frequency of tubercular meningitis in early life and the frequency of exudative catarrhs of the middle ear at the same period of life? If the caseous hypothesis of tubercular infection be true, there can be little doubt that there is such a connection. On this subject, Dr. Coats says, "We meet with a local tuberculosis of the brain, but where the virus comes from I do not know. It certainly does not come from a caseating centre, so far as I can discover." On the other hand, Dr. Hamilton says, "There is, I say it unreservedly, in those cases of so-called isolated tubercular meningitis, invariably, either in the brain substance, the bone, or the encephalic membranes, a cheesy deposit, which usually has an ordinary inflammatory origin."

In the pathological work by Jones and Sieveking, we find that meningeal tubercle is found, only in the rarest cases, to be the original morbid process. The antecedent disease is not always, however, tubercle of other organs, but it may be any form of degeneration or scrofulous inflammation, or anything which results in the formation of caseous masses." Again, in Ziemssen's "Cyclopædia," we find that "in the immense majority of cases of tubercle of the pia mater, a cheesy focus exists in the body;" also, in the same work, we find that "miliary tuberculosis of the pia mater is part of a general specific disease or absorption or infection, which has the same relation to the cheesy focus as pyæmia has to a centre of decomposition.

Supposing we have such a cheesy focus in the tympanum and antrum mastoideum of the child, on one or both sides—and they are generally on both sides—how may the virus be transmitted to the pia mater?

In infancy and childhood the mucous lining of the middle ear is very intimately connected with the interior of the cranium. There is at that time a considerable fissure in the roof of the middle ear, through which a large prolongation of dura mater, with vessels and nerves, passes from the interior of the cranium to the interior of the middle ear. In this way the middle ear, in childhood, may be looked upon as in direct communication with the meninges of the brain. Other gaps often exist in the roof of the tympanum and antrum mastoideum, and at such gaps the mucous membrane and the dura mater are in direct contact.

Thus the seat of the deposition of tubercle in tubercular meningitis is *very near* to the seat of the caseous centre in the ear.

When the infective matter is in the neighbourhood of the tubercular formation, it is usually believed that the medium of absorption and transmission is by the lymphatic vessels. The pia mater is extraordinarily rich in lymphatic vessels, and the tubercular growths are found on the inner surface or endothelium of these vessels. These lymphatic channels surround and enclose the

very numerous small arteries which ramify in the pia mater before they enter the substance of the brain. All the blood vessels of the brain are accompanied by these lymphatic vessels, or, as they are called, perivascular sheaths. Now, the internal auditory artery, the terminal branch of the basilar, which ramifies in the pia mater, close to the favourite seat of the tubercular deposits, inosculates freely with the stylo-mastoid artery, which furnishes the main arterial supply to the mucous membrane of the middle ear. In this way there is a ready lymphatic connection between the middle ear and the pia mater. Again, my friend, Dr. Adams, Demonstrator of Anatomy to the Glasgow University, shows, in a recent able and suggestive article in the *Glasgow Medical Journal*, how communication by the veins may take place between the middle ear, the brain, and its immediate covering, the pia mater.

Undoubtedly the great richness of the pia mater in lymphatic vessels must render it a likely place for the tubercular deposition. The infective agent, carried by the lymphatics, say from the ear, acts as a specific irritant upon the endothelium of the lymphatic vessels, and we have as a result the formation of miliary tubercles.

Why does the tubercular formation show a preference for the base of the brain? In the frequency of caseous formations in the middle ears of children, intimately connected with and close to the base of the brain, may we not have an explanation of the otherwise mysterious preference of tubercle, at that period of life, for the base of the brain.

We know that there is a channel, be it by lymph vessels or by blood-vessels, by which matter absorbed in the ear may reach the brain even when healthy tissue intervenes. Practical experience and observation in the cases of cerebral abscess, consequent upon disease of the ear, give too many examples of the possibility of such a means of communication.

We have now advanced reasons for believing that in caseous collections in the middle ear we have a likely source of tubercular disease, and especially of tubercular meningitis. The question which now awaits an answer is, Do practical experience and observation confirm our *à priori* reasoning?

Undoubtedly in the examination of the middle ear after death in persons who have suffered from chronic purulent disease of that part, caseous débris is frequently found to occupy the cavities of the middle ear.

So, far, however, as my reading has extended, I do not find any pathologist referring to this region as a source of the caseous virus. I have little doubt that the cause of this strange omission is to be found in the unfortunate indifference still shown in the profession towards the subject of disease of the organ of hearing; Professor Von Tröltsch, however, the accomplished aural surgeon, of Würtzburg related in Virchow's *Archiv*, so far back as 1859,* three cases of acute miliary tuberculosis occurring in persons who had suffered from chronic purulent disease of the middle ear. At that time he suggested, before he was aware of Buhl's writings on the auto-infection of tubercle, that some cases of tubercular disease might be due to the absorption of inflammatory products collected in the ear. He asks the question, "Whether many cases of suddenly beginning and rapidly coursing tuberculosis might not generally be due to an infection of the blood from a purulent collection at some part of the body?" It is also remarked by him, that in tracing the history of patients who have had otorrhœa, he has observed that many of them

* Virchow's *Archiv*, Bd. xvii. Section xiv. xv. and xvi.

die young. In such he found that tubercular meningitis, or tuberculosis of the lungs, or of the bowels, was generally the causes of death. Again, my friend Dr. Finlayson, Physician to the Glasgow Western Infirmary has shown me his papers hitherto only published in the form of an abstract,* containing notes of two cases in which death from miliary tubercle took place in children suffering from chronic purulent disease of the ear. In one of these there was a chronic local tuberculosis giving rise to hemiplegia as well as the more acute affection which terminated life. A case is also reported in the Archives of Otology for March of that year by H. Steinbrüge, of Heidelberg. It was that of a boy, five years of age, who in course of treatment directed to the evacuation of purulent collections in the mastoid cells was seized with symptoms of intracranial mischief terminating in death. The autopsy revealed tubercular basilar meningitis. No *direct* transmission of the morbid process to the brain could be discovered.

The following case has recently come under my own observation. A. B., a boy seven years of age, was brought to me suffering with a purulent discharge from the right ear of four years' duration. There had also been a discharge from the left ear, but this had ceased. The discharge dated from an attack of scarlet fever, when three years of age. The deafness had been so considerable as to interfere very much with the articulation and intonation of the boy. He was, nevertheless, remarkably smart and intelligent. He had not been, however, very robust, and had suffered seriously from the scarlet fever.

On examination I found a polypus protruding from the right internal auditory meatus. In the left the membrane was perforated but there was no secretion.

In the course of treatment it was found that there were three polypi, which had grown from the upper and back part of the tympanic cavity, and the posterior half of the membrane was destroyed. The discharge was evidently coming in great part from the antrum mastoideum and from the upper part of the tympanum. After three months of treatment the polypi were eradicated and the purulent secreting process put an end to. The hearing was markedly improved, and as a consequence the articulation and intonation became also markedly improved. He had gone to school and was progressing satisfactorily. To the inexpressible grief of the parents, and to my own painful disappointment, these gratifying results were only for a short time enjoyed, for a deadly disease quickly brought the boy's life to a close. Three months after the treatment for the purulent disease of the ear had ceased, the boy began to complain of pain in the head, followed in a day or two by vomiting and pyrexia. Without recounting all the symptoms and course of the illness, suffice it to say that the boy died in three weeks from the onset of the disease of what was regarded by the consulting physician who watched the case as tubercular meningitis. I saw the boy the day previous to his death. He was then comatose with abdomen collapsed and to all appearance in the last stage of tubercular meningitis.

When we consider such features in the history of this case as the duration and source of the discharge, it is almost certain that the antrum mastoideum and the other mastoid cells were occupied with purulent mucous and epithelial débris This débris would be retained, for the reasons already described, and in course of time would probably caseate, then soften, constitute the virus, which, carried by the lymphatics to the pia mater, produced an eruption of tubercles.

No doubt there have been many other cases observed in which tubercular

* Cases of Hemiplegia in Children : *British Medical Journal*, April 30, 1870.

meningitis or acute miliary tubercle occurred in persons who were suffering from, or had been suffering from, exudative disease of the middle ear.

In all such cases, however, it may be fairly urged that the existence of the disease in the ear is a mere coincidence, having no etiological relation to the tubercular disease. Or it may be reasonably maintained that the disease in the ear is a manifestation of the same constitutional tendency which produced the tubercular disease, that, in fact, instead of being the cause of the tubercular disease, the ear disease is the result of the tubercular tendency in the system.

I can only say, in answer to these objections, that in the light of the views of the etiology of tubercular disease which are held by some of the most eminent pathologists of our time, it seems probable to me at least, that the tubercular disease may, in many of such cases, have a sequential relation to the disease in the ear.

Unfortunately, in consequence of this part of this body being usually ignored by the pathologists in post-mortem examinations, the condition of the middle ear is rarely ascertained after death from acute miliary tubercle or tubercular meningitis. Unfortunately, also, the examination of the state of the ear is generally omitted during life by the physician.

I think, gentlemen, I have at least made out a case for the necessity of further investigation. In order to remove this matter from the region of reasonable conjecture to that of certainty, we require the aid of the pathological anatomist and the practical physician. The presence or absence of caseous collections in the middle ear should be made an important point for investigation in the case of persons who have died from tuberculosis, and especially from tubercular meningitis. Perhaps the missing link in the chain of evidence for the caseous theory of tuberculosis may be found here.

By the method suggested by Dr. Foulis, in the *British Medical Journal* for Oct. 16, 1880, the middle ear may be examined with sufficient minuteness to show the presence or absence of caseated inflammatory products, in the space of two minutes. The routine examination of the ear in the post-mortem room is, by this method, rendered simple and expeditious.

I have prepared these imperfect observations, partly with the hope of stimulating discussion here, and of thus hearing the views of my professional brethren on this most important subject. But in preparing this paper, I have also entertained the hope that the ventilation of this subject might contribute, in some degree, to increased attention to the organ of hearing, whenever acute miliary tuberculosis, and, especially, whenever tubercular meningitis comes before the physician or the pathological anatomist.

Krankengeschichte und Sectionsbefund eines an Carcinoma aur. med. et Labyrinth dext. verstorbenen 47-jährigen Mannes.

Prof. Adam Politzer, Vienna.

I. Krankengeschichte.

H. S. wurde nach längerer ambulatorischer Behandlung am 30. December 1879 mit Otit. med. supp. chron. c. perf. m. t. et polyp. dxtr., sowie einer haselnussgrossen Geschwulst hinter dem Ohre aufgenommen. Nach Entfernung des Polypen besserte sich der Zustand des Patienten derart, dass er am 4. Februar 1880

gebessert entlassen wurde und wieder in ambulatorische Behandlung trat. Rasche Vergrösserung der Geschwulst hinter dem Ohre, Zunnahme der Otorrhöe, beginnende Drüseninfiltration machten die Wiederaufnahme des Patienten nothwendig, besonders da Patient eine Operation wünschte.

Stat. praes. am 15. April 1880: Hühnereigrosse, gelappte, unebenhügelige, fleischrothgefärbte Geschwulst, mit stinkendem Eiter bedeckt. Hervorwuchernde Parthien des Neoplasmas im Gehörgange, starke Otorrhöe, Eiterretention, leichte Facialparese, die Ohrmuschel weit vom Kopfe abstehend.

Incision hinter und ober der Ohrmuschel; Entleerung eines bedeutenden Quantums stinkenden, dicken, blutigen Eiters. Erleichterung des Zustandes. Deutliche Facialparese.

Die microscopische Untersuchung der Geschwulst ergibt die Diagnose: Carcinom.

In den folgenden Tagen tritt collaterales Oedem der Augenlider auf. Constantes Wachsthum des Neugebildes hinter dem Ohre. Heftige Schmerzen. Morphininjectionen.

Am 13. März erscheint Patient hinfällig, somnolent. Uebergang der Facialparese in Paralyse. Entfernung neuer Wucherungen aus dem Gehörgange.

Am 19. März tritt Erysipelas fac. der rechten Gesichtshälfte auf, welches sich bald über die behaarte Kopfhaut ausbreitet mit Oedem der betreffenden Hautparthien. Temperatursteigerungen bis über 39°. Erst am 22. März beginnen Erysipel und Oedem abzunehmen und sind am 31. dieses Monats vollkommen geschwunden.

Am 7. Juni wird Patient auf Verlangen ungeheilt entlassen und in's Rudolfsspital transferirt, von wo er Anfangs Juli 1880 in das allgemeine Versorgungshaus transferirt wurde.

Als ich den Kranken daselbst zum ersten Male untersuchte, fand ich denselben vollkommen soporös, weshalb eine Prüfung der Hörfunction unmöglich war. Die Neubildung hinter dem Ohre war in grosser Ausdehnung exulcerirt, an der äusseren Ohröffnung wucherte die carcinomatöse Masse stark hervor.

Am 6. Juli 1880 trat der Tod unter Erscheinungen von Hirndruck ein.

II. Sectionsbefund des H. S.

Nach Entfernung der Ohrmuschel zeigt sich eine vom vorderen Rande des proc. mast. bis zum hinteren Rande des Jochfortsatzes reichender etwa 6 Cm. grosser Knochendefect, welcher von einer hirnmarkähnlichen Masse ausgefüllt ist. Nach oben ist der Knochendefect durch einen fast horizontal laufenden, dem oberen Rande des knöchernen Gehörganges entsprechenden, ausgezackten Knochenrand begrenzt. Die äusseren Parthien der unteren und vorderen Wand des knöchernen Gehörganges zerstört. Der Warzenfortsatz selbst äusserlich unverletzt.

Die Dura mater über dem Tegmen tymp. von der Neubildung in der Ausdehnung von circa 5 Cm. durchbrochen, von wo aus die, den ganzen Trommelhöhlenraum ausfüllende Neubildung gegen die Schädelhöhle wuchert und an der unteren Fläche des rechten Schläfelappens eine tiefe Depression bewirkt. In der Umgebung der Durchbruchstelle am tegmen tymp. ist die Dura in grösserer Ausdehnung durch die Krebsmasse vorgewölbt.

Die pars pyramidal. des Schläfebeines ist vollkommen beweglich durch Substituirung des, mit dem Schläfetheile sie verbindenden Knochens durch Krebsmasse. Die unteren Parthien des sin. sigm. sind von Krebsmasse infiltrirt, die intima selbst vorgebaucht, ohne Erscheinungen von Phlebitis.

Trommelfell gestört, desgleichen ein Theil des Trommelfellpelzes; der Warzenfortsatz ist nach innen cariös, misfärbig. Die Pyramide nach hinten ebenfalls cariös und misfärbig, die Trommelhöhlenwand derselben von Krebsmasse verdrängt, nur die hintere Wand derselben ist erhalten, das Ganze gegen die übrigen Theile leicht beweglich.

III. Die microscopische Untersuchung des Labyrinths.

Nachdem die zum Theile carcinomatös degenerirte Pyramide durch mehrere Wochen in Chromsäure unter Zusatz von Salpetersäure decalcinirt und später in Alcohol gehärtet worden war, wurden senkrecht auf die Längsaxe der Pyramide von vorne nach rückwärts microscopische Schnitte durch die Schnecke, den Vorhof und die Bogengänge geführt.

Die der Trommelhöhle zugewendete Spitze der Schnecke war durch krebsige Destruction der inneren Trommelhöhlenwand eröffnet, wodurch die Krebswucherung in das Innere der Schnecke eindrang.

Die Lamina spir. in der zweiten und letzten Windung ist stellenweise durchbrochen und sowohl die Scala tymp. wie die Scala vestib. durch gruppenweise angehäufte Krebszellen zum Theile ausgefüllt, welche theils an der äusseren Schneckenwand, theils an der Lam. spir. und dem Modiolus aufsitzen.

Von besonderem Interesse ist der Befund in der ersten Schneckenwindung, hier sind die Lam. spir. ass. e. membr. intact. An der Scala vest. sieht man an beiden Durchschnitten an der äusseren Schneckenwand eine Gruppe von Krebszellen, welche sich bis in das Corti'sche Organ erstrecken. Die Scala vest. von der einen Seite ist ganz frei, an der anderen Seite hingegen sieht man den Durchschnitt eines von der äusseren und unteren Schneckenwand ausgehenden, gelappten Krebsknotens, welcher fast zwei Drittheile der Scal. vest. ausfüllt. Quer durch denselben zieht ein Bindegewebsstrang, welcher mit der von der inneren Schneckenwand losgelösten Bindegewebsauskleidung zusammenhängt.

An einzelnen Schnitten lässt sich ein Durchbruch der Krebsmasse in den inneren Gehörgang constatiren. Der Vorhof war ebenfalls von der Trommelhöhlenseite arrodirt, die häutigen Gebilde desselben jedoch meist intact. Desgleichen die Bogengänge, welche stellenweise von einer homogenen, lichten Masse ausgefüllt und umschlossen waren.

Some Difficulties in the Diagnosis, Prognosis, and Treatment of Middle Ear Deafness.

Dr. P. McBride, Edinburgh.

My present purpose is to lay before you, in as few words as possible, some of the difficulties which beset us in the diagnosis, prognosis and treatment of some cases of that middle ear affection which is by Roosa most aptly and appropriately designated proliferous inflammation of the tympanum.

Although I cannot perhaps throw much light upon the question, yet I trust that by carefully stating what seems to be the present extent of our acquaintance with this subject, and by calling attention to apparent gaps in it, this paper may lead others, who are possessed of riper experience and greater knowledge, to a statement of their views concerning a form of ear disease which cannot be said to be fully discussed in any of our standard works.

The term "proliferous inflammation" is necessarily a wide one, and is meant to contain a large number of cases with which we are not concerned here, and where the diagnosis can be made with tolerable accuracy, as in adhesion of the tympanic membrane and malleus to the labyrinthine wall of the drum, or between the membrane and long process of the incus. It may, therefore, be well, before going further, to define the form of middle ear disease which it is more especially intended to discuss in this paper.

It is to those forms of deafness in which all the facts we can obtain from an examination of the organ of hearing are of a purely negative character, and in which we are called upon to form a diagnosis without any positive data, that I would invite your attention.

In these cases, the patients when they present themselves for examination are usually decidedly deaf, but occasionally the symptom most complained of is tinnitus, and the impairment of hearing has not yet become so great as to interfere with ordinary every-day pursuits. However, it is not so much of history and symptoms, as of the results of physical examination, that it is proposed to speak.

On ascertaining the amount of deafness in any case, the first object of the surgeon is generally to ascertain whether the hardness of hearing be due to changes in the sound-conducting, or sound-perceiving portion of the ear. Let us suppose that the practitioner has convinced himself of the fact that deafness is due to a lesion in the external, or middle ear, by the results obtained from applications of the vibrating tuning-fork to the cranial bones or teeth, his next object is to ascertain its nature. With this end in view he proceeds to inspect the meatus and tympanic membrane.

In a few cases of chronic non-suppurative middle ear disease, the condition of the former may afford a slight clue to the discovery of the exact nature of the lesion. Thus if we find the walls of the bony canal in a state of hyperostosis, the possibility, at any rate, occurs to one's mind of a similar state of matters in the tympanum; but the cases of middle ear catarrh which produce changes in the external auditory passage are the exception rather than the rule.

Turning now to the inspection of the tympanic membrane, we may also here find no changes to account for the presence of deafness. I cannot help thinking that from any large aural clinic a number of cases could be collected of middle ear deafness, where the appearances of the membrana tympani are, to put it moderately, not inconsistent with the presence of perfect hearing power. In a large number of cases of proliferous inflammation, changes are met with in the drumhead. It is frequently more or less indrawn from obstruction of the Eustachian tube, or it may be evidently thickened, and its mobility shown to be impaired, by using Siegle's pneumatic speculum; but there are also cases in which the membrane is, to all intents and purposes, normal, and in which we can draw no conclusions whatever from its appearance. There is no doubt that in many cases we find what may be considered a perfect membrane with the exception of an irregularity in the outline of the malleus which Von Tröltsch thinks may be due to ossification of its cartilaginous capsule; but although this appearance is frequently met with in cases of proliferous or dry catarrh, its meaning must be demonstrated, post-mortem, before we can attach to it characteristic significance, and besides, even this slight change is by no means always present.

In those cases where the tympanic membrane is normal in colour, mobility, and position, we not unfrequently find the patient able to perform Valsalva's experiment, and auscultation, while air is blown through the Eustachian catheter, shows the

tubes to be open and free from mucus. Injection of air into the middle ear, however, in cases of proliferous inflammation such as we are considering, generally fails to produce the slightest improvement in hearing. Some authors are inclined to attach considerable importance to the presence of inspissated mucus in the tympanum as a factor in the production of symptoms and signs resembling those of proliferous inflammation; but, in cases where the deafness was distinctly due to this cause, Mr. Hinton seems to have been able to produce distinct, though transient improvement, by means of the air douche, and in patients whose histories he records the presence of the hardened mucus was generally due to a number of attacks of subacute catarrh. Besides, in many cases inspection rendered the existence of a foreign body in the tympanum probable, if not certain. Dr. Woakes has recently described a group of cases in which deafness occurs without any changes in the tympanic membrane, and is due to paresis of the tensor tympani. Paretic deafness is characterized, according to this author, by a pendulous state of the soft palate, ill defined faucial pillars with local anæsthesia and often inability to perform Valsalva's experiment. From these conditions he diagnoses paresis of the palate muscles, and assumes a similar condition of the tensor tympani. Granting, however, that Dr. Woakes' explanation of middle-ear deafness, without characteristic changes in the membrane, may account for a certain proportion of cases, there yet remain others in which we have no signs of palate paresis. To Dr. Weber-Liel's "Progressive Schwerhörigkeit" I need not refer, for, as I understand it, in this form of disease marked deafness only results from secondary well marked changes, of which some are due to retraction of the tensor tympani, while others are of an inflammatory nature.

It would be most desirable for aural surgeons to come to a definite and unanimous understanding of their position with regard to cases of middle ear deafness where there are no physical signs and, of course, no characteristic changes in the tympanic membrane. Among the latter we can hardly include localised patches of opacity. In chronic non-suppurative middle ear diseases there may be indrawings of varying degree, changes from the presence of fluid exudation in tympanum, atrophic patches, cicatrices, or marked thickening and immobility of the drumhead. Of course, in the presence of any one of these conditions, more or less positive conclusions may be drawn; but I venture to think that there are many cases in which, even if the membrane be not quite normal in colour or lustre, its condition affords us not the slightest assistance of a positive kind.

There are cases, and those not very few, in which the results of objective examination are purely negative, and diagnosis must be based solely on the subjective sensations of the patient—viz., deafness for sounds conducted by aërial vibrations, uninfluenced by the air douche, and increased perception of sounds which are conducted directly to the labyrinth through the cranial bones, as shown by the tuning-fork test. In such cases we are justified in assuming that the deafness is due to intra-tympanic changes, and from what pathology has revealed, we must probably assume the presence of one or both of the following conditions:—

1.—Thickening or proliferation of the mucous membrane—most likely an increase of its fibrous or connective tissue elements.

2.—Thickening or new deposit of bone, or ossification of cartilage.

It is evident that, as a result, there may follow anchylosis of the ossicles, or impaired mobility in their joints and the membrane of the fenestra rotunda; but whether the lesion be at the malleo-incudal joint, or at the attachment of the stapes to the fenestra ovalis, whether the incus be anchylosed at its attachment

to the tympanic wall, or a fibrous plug fills the round window, we cannot tell. All we are justified in assuming, in many cases, is that one or other of these conditions is present. The late Mr.. Allen, I know, made an attempt to localize tympanic lesions from symptoms, but some of his assumptions in physiology require further proof. It is possible that very strong evidence in favour of anchylosis of the stapes may be furnished by Bing's method, which consist, in comparing the hearing power for sounds conducted through the Eustachian catheter with that for sounds, conducted into the meatus by means of an ordinary speaking tube; but the practical application of this method—although its theory is good—must yet be considered as on its trial. Hearing better in a noise Politzer is inclined to associate with a fixed stapes, but opinion is still divided as to the meaning of this symptom. As far as I can judge, from a limited experience, proliferous inflammation may owe its origin to various causes.

1.—In the first place it may exist as the remains of a catarrhal process, which has originally extended from the throat along the Eustachian tube to the middle ear. The former may have recovered its lumen, and the tympanic membrane its position, but deafness persists. In such cases the drumhead is generally more or less opaque, and the bright spot changed in shape, but still there may be no appearances present which are inconsistent with good hearing power.

2.—Then again, a process, ending in very considerable or even total deafness, may have its beginning and end in parts which are inaccesible to examination by either inspection or auscultation, as for instance the labyrinthine wall of the tympanum.

3.—In syphilitic patients we occasionally have evidence of the rapid formation of intra-tympanic adhesions, or proliferation of tissue. This fact has also been observed by others. To quote from Roosa: "There are no peculiar aural symptoms by which we may positively distinguish a case of chronic disease of the middle ear that was caused by syphilis from one occurring in a non-syphilitic patient, yet we may say in general that a syphilitic diathesis seems to cause proliferation of tissue to be more rapid and less amenable to treatment. "Schwartze," he goes on to say, "believes that the pathological change in these cases is a periostitis, and this view seems to be correct." From the observation of several cases of middle ear deafness, occurring in the course of syphilis, I am strongly inclined to endorse this view. I cannot help thinking that, where marked middle ear deafness, without any acute symptoms, has come on with great rapidity and where inflation of the middle ear fails to improve the hearing, we ought carefully to examine for evidence of a specific taint, and that in many such cases we shall find it. It would be interesting to know whether the experience of others points to any such connection of symptoms, as affording presumptive evidence of a specific process.

Now if syphilis has a specific effect upon the middle ear, the question may fairly be asked whether other diatheses may not also produce tympanic changes. In the tympanum we have a large variety of tissues and the parts are so situated that a very little lesion may produce the most disastrous results. The mucous membrane of the tympanum is a double structure. Its outer layer is mucous membrane, but its deeper parts are periosteum. It is then liable to be attacked, not only by catarrh, but also by periostitis. The joints of the ossicles are tolerably complete in their structure, having the same constituents as joints situated elsewhere, and there seems no good reason why they should not be involved in arthritic diseases. Indeed, Dr. Buckler, in 1853, called attention to the fact that chronic rheumatism may involve the ossicular joints. Of the value of his observations I have no means of judging, as I have been unable to obtain the original work; but as gout, rheumatism, and

rheumatoid arthritis attack other joints throughout the body, there seems no reason why those of the auditory ossicles should enjoy any special immunity. I am not aware that any recent observations on this point have been made, although Toynbee attached importance to the arthritic diathesis as a cause of anchylosis of the stapes.

The diagnosis of middle-ear deafness, with negative appearances on the tympanic membrane, is not always either easy or satisfactory. In cases where there are no objective signs to guide us, the first difficulty is to make out whether the deafness be due to middle ear disease or to changes in the sound-perceiving apparatus. For this purpose we are entirely dependent upon the tuning fork test. Where the latter, applied to the middle line of the head, is heard best in the deafer ear, and where its vibrations are perceived for a normal length of time we may fairly assume that the sound-conducting apparatus is at fault; but where perosseal audition is defective, we meet with considerable difficulty.

It is admitted on all hands that, after the age of fifty, inability to hear the vibrating tuning-fork placed on the cranial bones is so common that the symptom loses its value. Now it seems to me extremely doubtful whether we have any reliable means of distinguishing proliferous middle-ear disease with open Eustachian tubes, and normal membranes, from chronic changes in the internal ear, or auditory nerve, occurring in persons of advanced years. The question may, I believe, be considered an open one whether pathological conditions, which produce an unyielding condition of the stapes and membrane of the fenestra rotunda, may not in themselves cause impaired hearing of sounds conducted through the cranial bones; and this does not at all simplify our diagnostic problem.

However, in cases where, by means of the tuning-fork test, we are enabled to localize the cause of the deafness in the middle ear, and where there are no changes to guide us in the drumhead, we usually conclude that the lesion belongs to the class of proliferous inflammation when we are unable, by several successful inflations of the tympanum, to produce any improvement in the hearing power. This shows that the pathological condition is of such a kind that it is not influenced by the mechanical action of the air douche. In some cases the probability is that there is fixation of the stapes, but this can at best be only a conjecture. The unfortunate fact remains that there are many cases in which we cannot know anything more exact, concerning the morbid condition we are called upon to treat, than that there is, in all probability, a thickening or new formation of bone or fibrous tissue which interferes with the sound-conducting mechanism.

In the face of these difficulties, what is to be said of prognosis and treatment? It is far from my purpose to enter into all the various methods of treatment that have been tried in proliferous catarrh. I shall content myself with alluding to some of them in a general way. We have in these cases, as I have attempted to show, to deal with new formation of bone or fibrous tissue, obstructing the movements of parts concerned in the act of hearing. We require to get rid of these adventitious tissues to effect a cure. By applying our reason to this problem, we find that the means at our disposal resolve themselves into (1) operative; (2) therapeutic.

I do not think that the former is ever likely to recommend itself to the majority of the profession in cases of the kind we are discussing. In the present state of our knowledge, the serious and not always harmless operation of myringotomy, would have to precede any other step—in other words, an operation for the purpose of diagnosis must be undertaken before attempts at severing adhesions are made.

Therapeutic treatment must have for its object the absorption of the impeding bone or fibrous tissue; in some cases, more especially where there is a syphilitic taint, constitutional remedies are used to produce this result; but by most surgeons most reliance is placed upon various local applications to the tympanum (besides, of course, treatment to the naso-pharynx where this is indicated).

Some authors seem to think that drugs, such as very weak solutions of iodide of potassium, corrosive sublimate, &c., injected into the tympanum produce each a specific effect. Others, as, for instance, Grüber, adopt the more probable view that where these substances produce an effect, it is by exciting a slight inflammation, and in this way producing absorption.

For my own part, I cannot help thinking that, even adopting this latter theory, it is very difficult to understand how fully organized fibrous tissue comes to be absorbed in this way. In the early stages of its development, however, before the round cells have assumed a spindle form, it is comprehensible that absorption should take place. Whether fully developed cicatricial tissue or bone is capable of being made to disappear in the same way, I cannot but doubt. It seems almost easier to believe that in those cases of old standing proliferous catarrh, when good results follow the injection of fluids or vapours into the tympanum, the benefit is due to the long continued mechanical influence of the air douche which is a necessary accompaniment of injections through the Eustachian catheter or of the fluid itself when it is used in large quantity, as in Grüber's method of forcing fluids into the middle ear, without resorting to the latter (catheter).

On the Prevention of Dumbness in those cases where it follows Loss of Hearing.

Mr. Arthur Kinsey, London.

Mr. President and Gentlemen,—I feel it a very high privilege indeed to be permitted to submit a Paper to a Section of this most important Congress—a meeting at which so many illustrious members of the medical profession are gathered together from all parts of the world, to interchange ideas, principles, and forms of practice, for the alleviation of human suffering and affliction in all their many and varied phases.

As a layman, I should not have ventured to trespass upon the special province of this Section—viz., "Diseases of the Ear"—were it not in order to obtain an opportunity of inviting your careful and earnest consideration to the after-condition of those of your patients whom you have had the sad duty to declare incurably deaf from their earliest childhood.

To the little child this verdict appears nothing—is not heard, and is not understood—but on the parents, however, is reflected the full force and extent of the calamity; and when they appealingly ask of the physician or surgeon, "What is to be done with our little one now?" it were sad indeed to think they should receive mere words of kindly pity and commiseration, instead of cheering counsel and practical suggestion.

To show that I am not overstating the case, I submit the following quotation from a pamphlet published in 1877, entitled, "Vocal Speech for the Dumb." "As soon as our child's loss of hearing was beyond question, we brought her here to London for the best medical, surgical, and educational advice. We

hoped, indeed we never doubted, that we should have received the best advice about the education of our child from those of the medical profession whom we consulted. But such was not the case. Sad and disappointed, we turned to those who had devoted their lives to the education of the deaf."

Now, it is true the incident here recorded took place eleven years ago, and no doubt a certain advance has been made since then by the medical faculty and the general public in a knowledge of the true condition and requirements of that unfortunate class of the community, so long known as the deaf and dumb—but it is strongly to be desired that this knowledge should become universal. I turn with pleasure to two pamphlets written by the distinguished President of this Section; one published in 1872, wherein he expresses a hope that a fair trial might be given to a system of education for the deaf and dumb, whereby dumbness would be averted; and to the second published last year, again dealing with the question of educating deaf mutes, in which the writer says:—"In view of their advice being asked by the parents of deaf mutes on the question of education for such children, it has become a necessity for medical men throughout the country to acquaint themselves with the respective merits of both the old and the new systems." I will not detain you with a description of the two systems here mentioned beyond premising that by the "old" is meant the "French," or sign system, and by the "new" the "German," or speaking method. But this definition as to age is not exact—for history tells us that the speaking system was in vogue long before any method of signs was introduced. However, this is a small matter, the important point of the question being "Dumbness *v.* Speech. Hitherto, in this country, up to a very recent date, the unfortunate little one afflicted with deafness has grown up, lived, and passed away in utter and lonely silence—dependent upon motions of the hands and fingers for communication with his fellow sufferers, and, to a lesser extent, with the hearing world. Now, not to dwell upon all that is lost by reason of deafness—which doubtless was unavoidable—I must ask you to reflect that the secondary evil of dumbness has been, and is yet, entailed through improper treatment by those entrusted with the child's educational welfare. Such a melancholy state of affairs, it is fervently hoped, will cease when the medical profession protest with no uncertain voice against the continuance of deaf-dumbness, and awake the general public to an indignant knowledge of a gross scandal existing throughout the land. The average number of deaf mutes to the hearing population is estimated at about 1 in 1,600; 20,000 persons being returned in the census of 1871 as deaf and dumb. It is not impossible that the returns for this year will show an increase, from one cause or another, of over 10,000; and, taking the usual calculation of 16 per cent. being of school age, we shall find about 6,000 children growing up for the most part as speechless as the animal world.

This applies to our own country. Now let us direct our attention abroad. In most countries on the Continent—viz., Germany, Bavaria, Austria, Holland, Switzerland, Italy, and in some cases Russia, Sweden, Norway, Belgium, Spain, and even now in France itself—the very birthplace of the sign system—we find dumbness practically abolished; but in Great Britain, and all her vast colonies, in the United States of America, and, in fact, in all countries where the English tongue—or what does duty for it—is spoken, we find the deaf child, with some exceptions, debarred its use. Why this should be, it is difficult to understand, as it is an evil fully to be remedied, and, so long as it remains, a grave reproach to us all.

Upon this point of allowing our deaf to become dumb, Dr. Cassells, of Glasgow,

one of your excellent Vice-Presidents, very pertinently asked in the *Edinburgh Medical Journal* for February, 1878, "Why, for instance, are such children in this country permitted to grow up, not only 'in loneliness of soul,' but in absolute silence; while, on the Continent of Europe, they enjoy the blessings of social intercourse, and the freedom of speech? Why are hearing children alone destined to share the benefits that flow from improved educational methods, and the deaf ones condemned to be 'fossilized' by a method that seems incapable of appreciating their destinies?"

Why, indeed? But yet, for the major part, it is so, despite the laudable efforts of certain philanthropic persons, alas! too few. From our treatment of the mass of the deaf, we make them dumb—and this making them dumb is productive of further mischief.

We are well aware how the physical and mental constitution of man is affected by modes and habits of life; how certain occupations and trades entail well-defined benefits or evils, and we may in general trace these to a specific cause—viz., a pure or impure state of the blood. We may also freely admit that a perfect action of the respiratory apparatus and the circulation is essential to that absorption of oxygen and elimination of carbonic acid, which is a vital necessity. Fortunately for us, Nature has wisely provided that ordinary respiration, like many other functions of the human organism, is an involuntary action, but there can be little doubt of the beneficial effects of increasing respiration up to a certain point by voluntary effort, as by active exercise, speaking, singing, shouting, and laughing—in ordinary parlance, giving the lungs full play, and so maintaining a healthy condition of the blood.

Now, this is just what does not happen in the case of the dumb. They do not use their lungs freely in any way. Not in laughing or shouting, nor do they employ their vocalising organs, except in moments of great excitement, to give vent to a few most unpleasant and discordant sounds. They have little inclination, when young, to indulge in those games so favoured by school children, and which certainly seem (at least in this country) specially adapted to promote healthful respiration and circulation. So far as the deaf mutes are concerned, it would almost appear that but for the liberal use they make of their arms and bodies in sighing, they would have little exercise calculated to develop the chest in the slightest degree.

We find, further, in their case, that defective respiration occurs at the very outset—in the inspiratory act, which is usually performed through the mouth, instead of the nose, the latter organ being, as a rule, blocked up with mucous and other matter.

It is unnecessary before a learned body, specially conversant with hygienic principles, for me to dilate upon the natural results of what has just been described; but I should desire to adduce one or two authorities upon this point.

Dr. Harvey Prindle Peet, of New York, a man of large experience of the deaf and dumb, in his "Researches and Opinions," remarked that "in the deaf there was a liability in particular to pulmonary diseases," and in dealing with the statistics of the New York Institution for deaf mutes (1854) stated, "Among the deaf and dumb, between the ages of ten and thirty, the mortality of males is about 25 per cent. greater than among an ordinary healthy population of the same sex and ages, and that of the females full twice as great. The difference against the health of deaf and dumb children and youth, as compared with the general population of the same age, is but too distinctly accounted for by the prevalence of

pulmonary disease among the former. The period of greatest danger being once passed, they often attain a good old age."

James Hawkins in his work "On the Constitution of the Deaf and Dumb" says, "Their average duration of life is considerably less than that of the hearing. They are as children particularly disposed to tubercular phthisis, cerebral disease, and scrofulous tumefactions." Of fifty-nine deaths within nine years among 850 children under seventeen years of age, forty-one were from consumption." I cannot afford in the brief limits of this paper, to cite further cases, but must content myself with referring any one who may wish to inquire more closely into the matter, to a Paper "On the Health of Deaf Mutes," written for the recent International Congress at Milan, by Dr. Symes Thompson, of London, a gentleman taking a most active part in securing for them the joint benefits of health, speech, and mental attainments. "Mens sana in corpore sano." Scrofula would appear frequently to be the cause of deafness, and consumption the result of the ensuing dumbness. James Hawkins bearing upon this question says, "The mysterious taint of scrofula is detected in those born deaf, and in those who lose their hearing after birth. The majority of these who are deaf from malignant forms of fever or cerebral diseases belong to families in which scrofula is idiopathic, and scrofulous families intermarrying with other scrofulous families often find congenital deafness one of the many culminating effects of their imprudence." And this scrofulous diathesis, if not checked by proper diet, muscular exercise, pure air and active respiration, will probably develop into one of many diseases, not the least likely of which being consumption. So that dumbness may indirectly arise from a disease—viz., scrofula, through entailed deafness, and consumption being the ultimate result; if we remove the secondary consequence of the disease, we may render the causation of the final and more fatal mischief inoperative.

Reliable statistics concerning the deaf are difficult to obtain, and I am not at present in a position to produce figures for comparison with those already given; but the opinion expressed by foreign teachers to me has been, that the deaf, taught to speak, are healthier and happier than those who are kept dumb.

I will not detain you with the causes of acquired deafness, merely reminding you how frequently deafness results from a shock, such as a fall or a blow on the head—this should be widely known, especially among those to whom are entrusted the education of children, for, in the present day, as the old fashioned method of corporeal punishment is so generally discouraged, impatient, sorely-tried instructors are apt to resort to the box-on-the-ear punishment—one to be condemned as dangerous in the extreme, as rupture of the tympanic membrane or displacement of the ossicula, and even further mischief may ensue, from what is usually considered a harmless form of correction. Now to the very important point—the causes of congenital deafness. I shall limit myself to the two principal causes—viz., the intermarriage of blood relations; and, secondly, intermarriage of congenital deaf mutes. I may mention, in respect of the first, what is well known to you, doubtless, that deafness is only one of the many terrible afflictions which may result from such intercourse. I am quite aware that this is a moot point, and in 1875, Mr. George Darwin read a paper before the Statistical Society on "Marriages between First Cousins in England, and their Effects;" from that I take the following passage: "There is no evidence whatever of any ill result accruing to the offspring in consequence of the cousinship of their parents." Now myself having had access to many of the sources from whence he obtained particulars, I cannot agree with the conclusion arrived at. A supporter of his views, in an article contained in the

Westminster Review, October, 1877, wishing to prove that consanguineous marriages were harmless to the offspring, quoted from Mr. Darwin's paper, showing how that gentleman considered such marriages productive of evil to the amount of 4 per cent. only. The writer in the *Westminster Review*, however, went further, and endeavoured to prove that not only were they non-injurious, but rather the reverse, and were in particular conducive to prolificness. To support this view he quoted from a report to the American Medical Association made by Dr. Bemiss, United States America, showing that "883 marriages of consanguinity produced 3,942 children." Here he stops short, leading the reader to infer that these children were all sound and healthy. Let me finish the passage "of whom there were defective, in one way or another, 1,034; deaf and dumb 145; blind 85; idiotic 308; insane 38; epileptic 60; scrofulous 300; deformed 98."

In addition to which there died young, 883. From these figures we see that of the surviving children, we have upwards of 50 per cent. defective in some terrible way. Dr. Bemiss adds that after very careful examination of various asylums, he was satisfied that his researches gave him authority to assume that over 10 per cent. of the deaf and dumb, 5 per cent. of the blind, and nearly 15 per cent. of the idiotic in the State Institutions of America were the offspring of kindred parents, or of parents themselves the descendants of blood intermarriages.

Dr. Caspar Singer, of Vienna, estimated from statistics in 1876, that 25 per cent. of all deaf mutes are the result of consanguineous marriages.

Dr. Dudley Peat, of New York, writing on the subject, 1856, said "Of all known causes intermarriage is the most prolific causes of predisposition to deafness. It has been settled, beyond a doubt, that intermarriages of first cousins, and even some of second cousins, give rise to offspring which are generally of imperfect development, either idiotic, blind, or deaf and dumb."

M. Boudin, of Paris, in a Report in 1876, stated that consanguineous marriages represent (in France) about 2 per cent. of all marriages, while the proportion of congenital deaf mutes born from consanguineous marriages is to the whole amount of deaf mutes: in Lyons 25 per cent., in Paris 28 per cent., in Bordeaux 30 per cent.

It will be noticed that these figures agree with the American and Austrian statistics. Now to turn to the intermarriage of congenital deaf mutes. Here again we find opinions differing in regard to the consequences of such unions. Heads of institutions for the deaf and dumb, and medical men connected with them, are generally unanimous in considering these marriages productive of evil, not perhaps so often in the first succeeding generation, but very frequently indeed in the second—transmitted deafness thus showing a resemblance to other forms of hereditary defect by passing over a generation. Mr. Buxton, the late head of the Liverpool Institution, and present Secretary to the Ealing Society for Training Teachers of the Deaf, &c., instances the following remarkable cases. 1st. A mother of three mute children, who was the daughter of a deaf mute; the grandfather, though his own children heard perfectly, was one of eight deaf mutes, in a family of sixteen; of these sixteen, half were males, and half females; four of each sex could hear, while the other eight (four males and four females) were born deaf and dumb. Secondly, in a family of eight, three males and one female were deaf and dumb—one of these deaf women afterwards being married to a hearing husband, had two hearing daughters, each of whom, by hearing husbands, became the parent of a deaf son.

The Rev. W. W. Turner, of the U.S. America, stated at a Conference of Prin-

cipals in 1868 (after 20 years experience amongst deaf mutes), "That every consideration of philanthropy, as well as the interests of congenitally deaf mutes themselves, should induce their teachers and friends to urge upon them the impropriety of intermarriage." Dr. Harvey Peet, already referred to, calculating the chances of hereditary transmission of deafness, determines, in the case of both parents being congenitally deaf, the proportion to be one in ten: one parent being born deaf, the proportion falls to one in 130. The average number of cases of congenital deafness amongst the children of hearing parents being as already stated about one in 1,600. I fear I must not dwell any longer upon this important question, doubly important too, for the reason that the resulting mischief of the class of marriages just alluded to has been disputed—the denial being based on the fact that, taking a number of marriages, the offspring are found to be in perfect possession of all the senses, from which it is argued these unions are not productive of ill-effects; but if the examination be extended in both directions—to the more remote ancestry and descendants, we shall most surely find congenital deafness apparent. Time will not allow me to deal with several points which are mentioned in the abstract of this paper, therefore I must crave your indulgence for passing them over in silence. In conclusion, I should wish strongly to impress upon the public mind, through the medical profession, that deaf-dumbness is not a defect, as are blindness or deafness—*i.e.*, arising from imperfect organic structure, or nerve lesion—but is simply the outcome of neglect and mismanagement. Next, that dumbness has a marked tendency to produce or promote pulmonary disease.

Then, in regard to congenital deafness, that it is only too frequently engendered by ill-advised marriages.

It has been well said of acquired deafness, that one of the chief causes of the affection is owing to the increased skill of the physician—that there are fewer dead, but more deaf, victims of malignant fever and inflammatory disease. Let us hope, most fervently, that, through the effects of Congresses, such as the one we are assisting at on the present occasion, the skill of the physician may be yet further extended, and that not only rescued lives will be the reward of devotion and science, but lives physically perfect in all that was designed and intended by Nature.

Comment l'Onde Sonore arrive au Centre Acoustique.

Dr. Sapolini, Milan.

Quoique n'ayant que des idées à l'état de doute sur le sujet, je les soumets, afin que par les réflexions et les études des membres, elles puissent arriver à une théorie.

1.—La membrane du tympan est-elle toujours passive, ou s'y trouve-t-il des éléments actifs pour ses mouvements?

2.—Les sons pour arriver au centre auditif nerveux doivent-ils passer à travers, la chaîne des osselets?

3.—Les sons passent-ils par la fenêtre ovale ou par la fenêtre ronde?

4.—Est-ce par la rampe spirale moyenne que les sons sont appréciés?

5.—L'endolymphe du canal spiral est-elle isolée ou communique-t-elle avec l'endolymphe vestibulaire?

COMMENT L'ONDE SONORE EST PORTÉE AU CENTRE.

Le son et son intensité dépendent de l'intensité de l'air, au sein duquel il prend naissance et non de l'air au sein duquel il est entendu. Par les poumons l'air est

expulsé, et par les grosses bronches et la trachée vient, poussé comme dans un porte-voix dans la cavité inférieure du larynx. Dans cette cavité un premier cri ou voix peut être produit. En traversant suivantment les cordes vocales, le son vient informe, et c'est là que le timbre du son est constitué, voilà le porte-voix. Par les muscles de l'arrière bouche, qui modèlent l'onde sonore, et plus tard les muscles linguaux innervés, surtout par le nerf dit corde du tympan, Wrisberg dit que la parole peut être articulée et que l'éloquium se produit. L'onde sonore ainsi constituée, et expulsée par les lèvres, co-opératrices de la parole, se trouvera encore au milieu de l'air. Elle se trouvera donc dans le même véhicule où elle est née, et si l'intensité de l'air et de son élasticité ne sont pas changées, l'onde sonore ne changera pas non plus de timbre, sauf quelque dispersion latérale. L'onde sonore, semblable aux billes d'ivoire, par un mouvement de va-et-vient, c'est-à-dire par ses condensations et ses raréfactions, continuera bien sa course, et arrivera au pavillon et au conduit externe. Le pavillon, avec ses multiples angles de réflexion et d'inflexion, favorise, selon la perfection de sa facture, l'introduction de l'onde sonore dans le méatus.

La disposition et la silhouette du pavillon sont admirablement douées à cet effet et maintes considérations physiognomoniques peuvent être déduites à propos des penchants de l'individu—lesquels trompent rarement un observateur.

Un petit bourgeon, vous le savez, paraît au premier abord de la vie embryonnaire, couvert par la peau—peu à peu se développe en même temps d'ailleurs que l'embryon, par des ligaments; le dit bourgeon cartilagineux est fixé à sa place dévolue. La lame dermoïde, douée d'éléments musculaires, couvre de près le dit cartilage, et c'est par les attaches et les tiraillements de ces muscles que le cartilage se modèlera en pavillon. Si nous admirons si souvent la beauté du pavillon, il faut l'attribuer aux efforts contractifs de ces muscles. Sans les muscles héliciens l'élégante forme estétique de son bord ne serait pas produite, et si l'anthélix est bombé, il le doit aux muscles postérieurs et au grand et petit transverse; et si le muscle postérieur et les supérieur et antérieur auriculaires n'existaient pas, la conque ne présenterait plus sa belle concavité. La forme du pavillon est dictée forcément par ces attaches et par l'action de ces muscles. Si l'on prend une toile en caoutchouc flexible, coupée à peu près en ovale, et si aux lieux voulus on fixe des ligaments, on peut, par des tractions, former un pavillon qui ressemblera beaucoup au nôtre. Rien du hasard ne se trouve dans la facture de notre corps; tout est l'effet d'une cause raisonnée.

Les ondes sonores arrivent au pavillon qui les accueille toutes et les amène à la conque, au conduit acoustique externe, qui, impregné du même air, favorisera la continuation de la vibration sonore; et, par les angles multiples d'inflexion, la condensation des ondes sonores s'accomplira. Le son dans ce conduit est encore favorisé, soit par la chaleur qui se trouve au fond du méatus qui rendra l'air plus élastique, soit, parce que le dit conduit étant ouvert à une seule extrémité, il devient plus résonant.

L'onde sonore présente au devant d'elle une forme convexe due à sa condensation, et cette convexité touchera et poussera la membrane du tympan; et puisque cette membrane a une concavité normale de la périphérie au centre, ainsi toute onde se portera à son centre (qui, notons bien, n'est pas le vrai point central de la dite membrane), et là principalement la pulsation sonore sera projetée.

L'onde sonore doit, après, transpercer la membrane du tympan, mais alors elle perdra de son intensité qui s'affaiblit, devant passer d'un corps léger à un solide.

La membrane du tympan.—En peu des mots, permettez que je détermine son analyse anatomique. Cette membrane ovulaire est composée extérieurement par la

couche dermoïdale, négligeons l'épiderme. Toute lame dermoïdale étant un tractus cellulaire doit, ou peut, contenir des fibres musculaires ou simplement des fibres élastiques rétractiles. Cette lame dermoïdale, en s'enfonçant dans le conduit cartilagineux, et plus tard osseux, s'appliquera au cercle tympanique, un des os operculaires, où elle s'enfonce et se fixe dans sa rainure. Cette lame présente un cul-de-sac, mais puisque de son bord périphérique elle se porte au centre, elle devra exhiber des stries radiaires, qui si elles ne sont pas musculaires, sont au moins des fibres élastiques qui vont s'imbriquer soit à la pointe soit au manche entier du marteau. La membrane du tympan est revêtue en dedans par un autre tractus qui provient, comme Blainville nous l'a dit, de la lame muqueuse qui, passant de la bouche le long du tube d'Eustache, vient tapisser la cavité tympanique. Toute muqueuse est, on peut être, composée de fibres musculaires, comme l'intestinale et la bronchiale, ainsi la page de cette muqueuse qui s'applique à la membrane du tympan, apportera ses contingents anatomiques; ainsi la partie externe de la muqueuse viendra en contact direct avec le côté interne de la lame dermoïdale externe. Mais la lame externe de la muqueuse ne pourra pas présenter comme l'autre des rayons radiés, car elle a formé son cul-de-sac à la partie postérieure interne de la cavité tympanique et par la raison que cette lame y a subi un fort élargissement en tapissant la dite cavité, elle présentera une forme utriculaire. Imaginons une ampoule avec un col long, étroit, qui représente le tube d'Eustache, et que le ventre de l'ampoule naine soit comprimé sur les deux côtés opposés, et nous aurons la forme de la cavité tympanique. Si une masse de verre en fusion était striée par des couleurs, l'ouvrier en soufflant formerait la bouteille, sur le ventre de laquelle nous trouverions dessinées des stries presque circulaires. Ainsi la page interne de la membrane du tympan se présentera dessinée avec des stries circulaires, et les deux membranes, l'une à l'autre appliquées, desquelles se compose la membrane du tympan, ressemblera à l'iris.

Le manche du marteau se trouve serré au milieu des mailles des deux dites lames desquelles la membrane du tympan est composée. Revenons à la vibration de l'onde sonore sur la membrane du tympan: une vibration est composée de deux moments, le premier de condensation qui convexe, frappe, ou je dirai mieux, presse sur la membrane du tympan, et l'effet immédiat sera sans doute de la pousser de dehors en dedans—le second temps c'est la raréfaction, c'est-à-dire, que, à la convexité énoncée, succèdera la concavité, et ainsi de suite, par les ondes qui se suivent, il s'établira un va-et-vient propre à toute onde sonore lumineuse ou liquide.

Je pense que la concavité créée par la pulsation doit naturellement exciter la réaction des fibres propres de la membrane du tympan, et cela autant de fois que l'onde sonore ou sa vibration a été vive, tandis que dans le cas de calme, la simple raréfaction de l'onde suffira à rétablir l'équilibre de la membrane du tympan.

CAVITÉ DU TYMPAN.

Ce n'est aucunement mon but de vous détailler la silhouette de ce boudoir, chaque meuble qui le décore est bien connu par vous, et mon dire serait une goutte portée à l'océan de vos connaissances, mais pour mieux en arriver à ma raison finale et pour mieux pouvoir m'expliquer, permettez que j'en parle, fût-ce même au risque de votre ennui.

Depuis la ligne d'attache supérieure de la membrane du tympan, au-dessus de 'apophyse grêle, et même au-dessus du muscle grand extenseur de la membrane, on peut séparer mentalement une cavité osseuse, dont le plafond nous offre

un véritable arc. Cet espace rond contient la tête du marteau et la moitié supérieure de l'enclume; un ligament descend du dit plafond et il peut tout seul, isolé, tenir en suspens le marteau. Le dit espace arcué est bien plus large que le contenu, ainsi la tête du marteau qui est externe et le corps de l'enclume qui lui est postérieur et interne, peuvent bouger en tous sens.

La tête du marteau est ronde et bombée du côté de l'enclume, limitée en bas par un collet fortement prononcé, qui à son tour est limité par la dite apophyse grêle. L'enclume qui pris dans son ensemble se dessine en triangle, offre au centre, qui en est le corps, une facette fort concavisée, sémilunaire, ayant donc une corne supérieure et une corne inférieure. C'est dans cette concavité que la tête postérieure bombée du marteau se pose, et par là, la corne supérieure de l'enclume montera un peu au-dessus de la tête du marteau, tandis que la corne inférieure se nichera dans le coin anguleux du dit collet du marteau. Par une capsule résistante les parties décrites des deux os sont couvertes et serrées, tandis qu'entre elles il existe une articulation complète qui leur permet des mouvements.

L'enclume, autant que le marteau, et un levier qui a son hypomochlion dans la grosse apophyse, est fixée à la paroi postérieure de la cavité tympanique, au moyen d'une petite surface arti laire, ce qui lui permet un mouvement de rotation sur son apophyse.

Nos deux osselets, mai teau et enclume, sont unis entre eux et forment une tête complexe de laquelle se détachent le manche du marteau et la jambe de l'enclume qui descendent en bas, sciant la cavité du tympan perpendiculairement; de sorte que la coupure tombe au devant du manche et épargne ainsi la fenêtre ovale, &c., que l'étrier reste en place. On croît avoir en perspective un polype, ou un monstre dymésitrique avec deux jambes tordues et valgues. L'une qui provient du marteau, s'unira à la membrane du tympan, se tournant en dehors, et l'autre jambe plus courte se tordra en dedans visant à la paroi Dymére interne de la cavité tympanique. (Suivons la chaîne pour ne plus y revenir.) L'extrémité de la jambe de l'enclume dessine un angle presque droit, sa pointe est ronde et convexe et c'est là que la concavité de l'os lenticulaire s'adapte: le petit os à son tour montre une petite convexité qui devra s'adapter aussi à la tête concave de l'étrier; le dernier osselet offre, on le sait, deux branches qui ont une position horizontale. Il faut remarquer surtout que l'étrier depuis sa connexion avec le lenticulaire monte, offrant ainsi un plan incliné de bas en haut depuis la pointe terminale de l'enclume à la fenêtre ovale; il en résulte que la platine de l'étrier tout en fermant la dite fenêtre laisse une rigole ouverte au bord supérieur postérieur de la dite fenêtre ovale. L'angle droit donc que nous avons remarqué le long de la courbure de la dernière portion de l'enclume, deviendra par l'os lenticulaire et plus tard par la tête de l'étrier un angle aigu. Tel est la position des trois osselets à l'état normal c'est-à-dire de repos, position, qui devra naturellement être changée lorsque la dite chaîne sera mise en mouvement.

Je ne veux pas laisser ce point sans évaluer et apprécier grandement la facture et la position toute spéciale du petit os lenticulaire. Souvent on l'a considéré comme inutile, tantôt il fut négligé et parfois même nié—pour moi il a une grande importance. Il me fait l'effet avant tout de ces boules qui dans les étaux facilitent tout mouvement; il est le vrai centre de tout mouvement entre l'extrémité de l'enclume et la tête de l'étrier, ôtez-le et les dits mouvements seront difficiles, et si par une raison donnée, il arrive un mouvement brusque, il arrivera une désarticulation entre eux; ôtez-le et un mouvement rapide de l'enclume sera communiqué brusquement à la fenêtre ovale.

Le lenticulaire est un osselet très providentiellement confectionné qui montre encore une fois comme la nature avec peu sait suppléer et apporter de grands effets, et devant ce grand facteur artiste qui nous donne à chaque instant le code des lois et des forces physiques je m'incline plein d'admiration. L'os lenticulaire est un vrai bijou, indispensable au milieu de la chaîne des osselets.

Après cet aperçu de la position d'ensemble de la chaîne des osselets et de leurs mouvements réciproques possibles, résultant de leurs attaches et articulations, tâchons de suivre quelques-uns de leurs mouvements principaux.

L'onde sonore, en vibrant, apporte sa pulsation convexe sur la membrane du tympan qui devra s'y accommoder, donc se courber mécaniquement du dehors en dedans—la pointe et le manche du marteau devront plier dans le même sens, mais étant fixé au bord supérieur de la membrane du tympan, et par des attaches ligamenteuses, et par le muscle externe postérieur, et par l'apophyse grêle sur le devant de laquelle s'imbrique le muscle antérieur interne, la tête du marteau sera portée en dehors autant que le ligament suspensoir le permettra—la concavité semilunaire du corps de l'enclume sera à son tour obligée de suivre la tête du marteau et de se porter conséquemment à l'extérieur, tandis que sa jambe s'élèvera. De là l'angle aigu, dessiné à l'état de repos, entre la dite crus, et l'os lenticulaire et le plan de l'étrier, cet angle aigu deviendra angle droit. Par un tel mouvement la platine de l'étrier qui par son bord supérieur, nous disions tant soit peu éloignée du contour supérieur de la fenêtre ovale, en basculant de bas en haut, devra la fermer complétement. L'onde sonore en poussant en dedans la membrane du tympan, poussera aussi en dedans la platine de l'étrier. Si le premier temps d'une vibration est la condensation, suivi du second, la raréfaction, tout le mouvement décrit devra rétrograder et reconduire la chaîne à l'état primitif du repos; mais les ondes se suivent et continuent, et le mouvement de va-et-vient se continuera aussi.

L'on comprend qu'une série de différents mouvements peut s'effectuer le long de la chaîne des osselets, et nous pouvons les comprendre et les apprécier toutes les fois que l'un des muscles s'attache par exemple au-dessous du collet du marteau et qu'il est mis en contraction ou en relâche. Mettons en action par exemple le grand muscle extenseur en tirant sur le marteau, il porte son manche avec la membrane du tympan en dedans, sa tête en haut et à l'extérieur, le corps de l'enclume doit suivre, sa jambe sera portée en haut et en dedans; ainsi modifié l'angle aigu ou angle du repos, qui est, facilité par le petit nœud lenticulaire, se relèvera de bas en haut les branches de l'étrier—l'angle aigu sera positivement devenu angle droit, et la platine de l'étrier fermera complètement la fenêtre ovale, aidée par son muscle homonime.

Les détails de ces mouvements multiples commandés par ces muscles nous entraîneraient trop loin, il y aurait confusion et ennui tandis que chacun de nous, soit mentalement, ce qui est un peu difficile, soit tenant en mains les grandes photographies du Dr. Politzer, pourra parfaitement saisir les différents mouvements possibles de la chaîne selon l'action de l'un ou de l'autre muscle, ou de la simple pulsation de l'onde.

Il est dit par nos maîtres en physiologie que le son passe à travers la membrane du tympan et par la chaîne des osselets et ainsi traduit au centre son effet spécial. J'en doute. Le son perd avant tout, disons-nous, de son intensité en traversant la membrane du tympan, après, en passant à travers le long de la chaîne, il perdra encore davantage de son intensité.

Est-ce que la nature peut avoir construit un tel échafaudage tordu pour mieux traduire le son au centre: c'est-à-dire un manche de marteau tordu et imbriqué au

milieu des deux pages de la membrane du tympan, et à travers les quatre articulations qui lient entre elles les osselets.

L'enclume doit faire une dispersion du son par sa grosse apophyse qui se pose à la paroi postérieure de la cavité tympanique; de l'enclume, le son continuera son chemin le long de sa jambe rachitique et puis à travers son angle aigu et par le lenticulaire sera transmis à la tête de l'étrier où le son devra être divisé sur ses deux branches et de là enfin poussera la platine pressée contre la périlymphe du vestibule. Valait-il bien la peine de placer aussi près de la membrane du tympan un centre sensible pour que l'onde sonore eût à faire un si long chemin? Notons que les osselets ne sont pas composés d'une texture uniforme : spongieux dans leur milieu et seulement revêtus d'une couche dure. La membrane muqueuse à plis serrés ou lâchés revêt les osselets et leurs jointures. Tous ces éléments physiques ne sont-ils pas fort contraires à la transmission des sons?

Quel peut être le service que la chaîne nous rend?

Voilà une proposition que j'avance et que je soumets à vos études. Vos réflexions sur un tel point, faites avec la sagesse sérieuse que vous apportez en toute chose, finira par une solution physiologique, et j'espère que bientôt cela s'accomplira par vos efforts, car je n'ai pas longtemps à attendre.

Et c'est pour gagner du temps que je vais, avec une juste reluctance, soumettre mes idées ou mes doutes à votre jugement.

Pour moi la chaîne des osselets ne doit pas être le milieu créé pour la transmission du son. Ils seront peut-être enveloppés par l'atmosphère résonnante de la cavité tympanique, mais pas le rail sur lequel l'onde s'achemine et glisse. La chaîne n'est pour moi 1° qu'un moyen d'alarme donné par le petit choc de la platine de l'étrier à la périlymphe du vestibule et par là au centre essentiel de l'audition; 2° la chaîne doit par son dernier osselet agir en étouffant le son qui, en vibrant trop vivement, pourrait ébranler le centre nerveux.

Chacun de nous a dû se plaindre et être désagréablement frappé par un son inopinément arrivé à notre oreille. Un coup de canon imprévu nous a désagréablement secoués, mais le même coup de canon ou de tonnerre ne fera pas le même effet et nous pouvons assez bien le braver sachant qu'il doit vibrer et éclater. Et quel est le moyen utile pour obtenir cela? C'est, je pense, par le muscle dit extenseur de la membrane du tympan. Connaissant le jeu des mouvements qui peuvent se prononcer dans les osselets, il nous sera assez facile de comprendre que le dit muscle volontaire, l'extenseur, qui a son point d'insertion au-dessous du collet du marteau, en se contractant, tirera en dedans et en haut le manche du marteau et avec lui la membrane du tympan, conséquemment l'enclume sera poussée aussi en haut et en dedans. Par là l'angle aigu normal dessiné entre l'enclume et le lenticulaire et l'étrier deviendra angle droit et la platine du dernier sera serrée contre la fenêtre ovale et la fermera totalement.

Plus haut en parlant du petit os lenticulaire j'ai tâché de lui donner toute son importance, et c'est ici, dans ces mouvements, que nous devons grandement l'évaluer; car, par le choc vif que la rapide contraction du muscle extenseur peut donner à toute la chaîne des osselets, la petite et fine membrane circulaire qui réunit la platine au bord ovulaire de la fenêtre ovale, si le lenticulaire n'excitait pas, le mouvement n'aurait pas, avant tout, sa rapidité; et, trop souvent, la chaîne serait interrompue et cassée. Le muscle extenseur par sa contraction doit, je le répète, empêcher que le son abrupte et violent puisse affecter le centre; et la platine de l'étrier agira, à mon point de vue, comme un étouffoir.

Il en résulterait, si j'ai pu bien m'expliquer que ce n'est pas à travers la longue

chaîne des osselets que l'onde sonore passera, mais qu'elle doit servir seulement d'obstacle, prévoyant le choc violent au vestibule.

Et pourtant je ne nierai pas qu'un son puisse filtrer à travers la fenêtre ovale. Je crois à l'envers de ce que le célèbre Scarpa a écrit, je crois que l'audition automatique ne se fait pas par la fenêtre ronde, mais par l'ovale qui à l'état de repos présente une fine rigole due à l'inclinaison normale de la platine de l'étrier, mais cette audition automatique ne s'accomplit aucunement par le médium des osselets.

Par où donc l'onde sonore passera-t-elle et sera-t-elle traduite au nerf spécifique ?

Très modestement et avec peu de ressources probatives je vais vous présenter mes idées et mes pensées craintives. Jugez-les !

Une onde, dix, mille, tout un orchestre arrive sur la surface de la membrane du tympan. La dite membrane, sensible, mobile, est libre surtout au segment inférieur, c'est-à-dire au-dessous de l'insertion terminale du marteau ; là elle est transparente, homogène et plus apte à laisser passer les sons. Arrivée au-delà le flot des ondes, se trouvera presque en face de la fenêtre ronde qui est encadrée par une espèce d'entonnoir collecteur des ondes. Mais quelles preuves de cela ? Je dirai avant tout que l'on peut perdre une partie ou presque toute la chaîne des osselets, que la chaîne peut être interrompue, qu'il peut ne rester que la platine de l'étrier contrainte dans sa niche ovalaire et que néanmoins, l'ouïe restera suffisante ; que si, par une cause mécanique, la périlymphe cochléaire s'écoule en dehors par une fissure de la fenêtre ronde, toute audition cessera ; que, si après quelque temps la dite fissure heureusement se cicatrise de nouveau, le périlymphe, abreuvant les rampes cochléaires, l'ouïe se rétablira. Une preuve peut-être concluante, nous la trouvons dans le fait que si le manque d'air ou de vide a lieu dans la cavité du tympan, l'audition s'infirme et diminue tellement que l'on n'entend rien du tout. Eh bien ! si l'onde sonore, depuis la membrane du tympan, avait pour son médium de translation au centre la chaîne des osselets, l'audition devrait s'accomplir quand même.

Du reste, rien de plus juste et de plus naturel que le son, né dans l'air, arrive à la membrane du tympan, et, de nouveau dans l'air, de la cavité homonime ait à continuer sa course dans le même milieu aëré. L'onde sonore serait alors recueillie dans le petit bassin ou entonnoir de la fenêtre ronde, et de là pénétrerait dans le limaçon.

La cochlée, ou limaçon, est tellement construite, il y a là tant d'éléments anatomiques qu'un nouvel horizon se révèle, qu'un monde nouveau, plein de beautés et de doutes difficiles, se présente à nos considérations. Je crois que voulant construire un simulacre grossier de cet organe pour mieux comprendre sa facture interne, étant donnée la tige osseuse, il n'y aurait rien de mieux à faire que de prendre deux tubes coniques flexibles, en caoutchouc. Coupez leurs deux pointes coniques et sondez-les ensemble, il en résultera alors un seul tube qui sera plus étroit à son milieu et les deux ouvertures élargies se trouveront à leurs extrémités. Fixez leur centre sur l'extrémité fine de la tige, et les deux tubes descendant en dorloir et posés l'un sur l'autre vous les enroulez sur la dite tige et de telle manière vous aurez construit le limaçon. Les parois des dits tubes qui se touchent formeront la lame spirale membraneuse qui est divisionnelle des deux rampes. Si vous façonnez la tige centrale à l'instar du modiole, qui n'est que la charpente et le soutien au contour duquel se prononce une épine osseuse, cette crête circulaire large au commencement et de plus en plus étroite vers sa sommité, représentera la rampe osseuse qui se nichera entre les deux parois superposées des dits tubes élastiques, lesquels forment la lame spirale membraneuse. Les deux tubes superposés et pressés l'un contre l'autre prendront dans leur inté-

rieur la forme, chacun, d'un demi-canal ovulaire ayant une paroi ronde et une plate. Dans le canal tympanique, la paroi ronde se dessinera en bas et la paroi plate en haut, tandis que pour le canal vestibulaire le rond plafond sera en haut et le plat paraît en bas.

Les deux parois plates réunies et collées donnent l'image grossière de la lame spirale.

Au milieu des dites parois, il y a donc la crête osseuse qui fait partie intégrante du modiole qui contient dans son milieu les irradiations du nerf cochléaire qui devront s'étaler sur la lame spirale membraneuse, la dentelée et la pectinée. Cette lame membraneuse, toujours représentée par nos tubes élastiques, va se terminer en un ligament, ou muscle de Todd et Bowman, et se fixer à une petite crête qui se trouve à la périphérie du tube complexe osseux. Et dans ce point encore les deux parois plates de nos tubes élastiques s'écartent pour faire place au vaisseau veineux, l'hélicoïde.

En résumé, le canal osseux du limaçon n'est qu'un cône large en bas et très-étroit en haut, qui doit contenir les deux tubes flexibles représentés plus haut, et le périoste du cône osseux, et qui formeront à son milieu une membrane divisionnelle. Et c'est par cette division que nous avons la rampe tympanique et la vestibulaire.

La première, tympanique avec sa portion inférieure et large, commence au petit évasement de la fenêtre ronde, qui est fermée en dedans par une membrane propre ou périostienne, qui est doublée en dehors par la membrane muqueuse de la cavité tympanique.

Rien ne se pose sur cette membrane—elle est libre ; les ondes sonores dans l'ambiant de la cavité tympanique sont arrivées et libres dans leur direction et dans leur véhicule aérien naturel, et ayant regagné le peu d'intensité qu'elles avaient perdues en traversant un corps solide, la membrane du tympan. Par la chaleur de la dite cavité, le flot des ondes sonores accumulées à la fenêtre ronde passera dans la rampe inférieure tympanique, et après avoir monté le long de deux tours et trois quarts, arriveront à la sommité, au schiphus, et, par l'ouverture laissée entre les deux tubes conoïdes réunis par leurs côtés externes, les ondes, suivant leur course et poussées par de nouvelles, descendront par la rampe supérieure ou vestibulaire.

Tous nous connaissons cette rampe par les grands travaux anatomo-microscopiques du Marquis Corti, et par Reissner, Tahle, Doprat, Huchske, Schultz, Todd et Bowman, Kölliker, et par bien d'autres, qui avec leur talent et leurs investigations l'ont si patiemment illustrée; et sur elle, permettez-moi que j'ajoute quelques réflexions.

Remarquons de nouveau que la rampe vestibulaire étant constituée par la moitié supérieure du cône cochléen, elle présente une forme à l'envers de la rampe tympanique. La rampe vestibulaire, si le tympan a donc un plafond arqué, est en voûte et ses parois déscendantes s'implantent sur la lame spirale; par cette facture les sons doivent être mieux disposés à être absorbés par le grand étalage nerveux propre de la dite lame, car une voûte est physiquement mieux résonnante, car de ses angles la réflexion des ondes sera accomplie et projetée sur la lame plate.

La lame spirale membraneuse, qui est toute simple et lisse du côté tympanique, est au contraire très-composée du côté vestibulaire, où des éléments multiples et diversement disposés y sont étalés. C'est sur ce point bien difficile et important, que des savants anatomistes ont exercé leur patience, si bien que cette lame à été divisée en portion sillonnée, dentelée, et en portion pectinée.

Les nerfs cochléaires extrêmement subdivisés, lorsqu'ils transpercent la paroi *foraminulenta* du fond du méatus acoustique interne, entrent dans la tige ou *modiolus*, et, se subdivisant de nouveau en un réseau admirable, ils se plient en dehors; enfermés dans la crête osseuse canalisée, qui se façonne, à sa dernière limite, en deux tablettes, les dits nerfs se rendent à la rampe supérieure, de là sur la face vestibulaire. Ce qui arrive après, la disposition toute spéciale qui s'y modèle vous est bien connue, seulement je vais user de vos études et de vos préparations microscopiques pour arriver à des idées physiologiques touchant directement l'ouïe.

Le flot des ondes sonores monte par le canal demi-conique tympanique, si un obstacle se rencontre ou dans la rampe ou au sommet congénital, ou occasionné par maladie, soit dans les parois osseuses ou périostiennes, soit par du sang épanché. Si non, toute onde sonore serait en partie ou en totalité empêchée dans sa course et refoulée en bas tumultueusement et là il résulterait une fausse audition ou un manque d'ouïe, et une myriade de bruits diversiformes musicaux qui tourmenteraient nos malades et les médecins.

Et la surdité peut avoir son point de départ bien souvent dans le sommet il peut s'y constituer une digue qui, partiellement ou totalement, empêche le passage des sons à travers la *lagena* pour descendre dans la rampe vestibulaire, là où les nerfs sont évidemment disposés pour être enveloppés par les ondes sonores, qui, à l'instar d'une rivière pulvérisée, seront absorbées.

Plus de quarante gerbes ou faisceaux nerveux peuvent être énumérés, et tous ces faisceaux sont à leur tour composés d'une série divisionnelle de filaments, et tous viennent du milieu de la lame osseuse et de bas en haut, comme à travers d'un fin tamis pénétrent dans la rampe moyenne, c'est-à-dire qu'ils s'étalent sur le pavé du canal spiral médian pour constituer tout ce monde sublime et nouveau d'éléments nerveux qui furent si bien étudiés et décrits par Corti le premier. Je crois que toutes ces dents des deux rangées, que la fine disposition des fibres innombrables et des articles placés sur la rampe moyenne doit être le point essentiel créé pour l'appréciation des sons. Il y a sur cette planche merveilleuse, qui est le pavé du canal spiral interne ou rampe médiane, une longue série d'octaves constitués par des touches sans fin qui doivent être abreuvées par les ondes sonores. Je pense que ces nerfs diversement façonnés doivent former une toile fine et suivie, de sorte que les sons qui nous arrivent par notes détachées sur cette toile doivent se réunir et se suivre.

Parmi les instruments inventés, ceux à anche sont ceux qui répondent le mieux pour faire disparaître les traits d'union, les battements entre note et note, et notre larynx répond par excellence à ce but; mais, néanmoins c'est une facture si admirable, que les notes émises montrent et marquent à une fine oreille musicale les dits traits d'union entre elles. La note chantée, même filante, est l'effet complexe de plusieurs agents matériels mises en action, mais juste à cause de ce grand effort, le chant reste toujours un canevas à mailles plus ou moins serrées, mais bien loin d'être une fine batiste.

Il y a donc une distance entre note et note, qu' une voix finement construite et soigneusement éduquée peut diminuer, mais que des oreilles très fines attrapent encore.

La rampe médiane est couverte par la périlymphe à travers laquelle les sons doivent filtrer, ce qui doit donner aux sons une enveloppe moëlleuse, veloutée. Mais il y a plus; il y a une autre enveloppe encore plus homogène qui protège ces nerfs. Les nerfs cochléens spécifiques ne sont pas directement en contact avec la tenue périlymphe, car de l'angle supérieur du demi-canal spiral, une membrane dite

homogène par Corti le premier, s'étend, qui se porte jusqu'à la terminaison de la membrane spirale et qui finit à la crête externe osseuse de sorte qu'un canal médian se constitue sur le pavé duquel les dents, les fibres, avec ses articles, multiples sont disposés. Dans ce canal, ou sinus médian, une humeur extrêmement tenue et transparente, les abreuve, c'est l'endolymphe cochléene. Peut-on imaginer quelque chose de plus finement merveilleux ? Nul organe ne montre une si sublime facture. Tous ces petits organes, ces dents, ces fibres, ces articles, passez-moi la comparaison grossière, sont autant de touches à différentes séries disposées, et sont l'un et l'autre entrelacés.

L'onde sonore déjà moëlleuse, veloutée, est encore obligée de se tamiser à travers la membrane homogène et endolymphe avant de trouver sa touche ou mieux son article à l'unisson, et toute cette longue myriade de fibres nerveuses et d'articles au lieu de résonner sont caressés, embaumés par cette douce atmosphère musicale.

J'ai parlé des touches comme d'un grand clavier, mais dans celui-ci les touches frappant sur la corde au point déterminé produisent le son, tandis que les touches de la lame spirale attrapent, absorbent le son qui lui est apporté déjà tout fait.

Il me paraît qu'étant porté en leur contact cette pulvérisation sonore, ces petits organes en sont inhâlés. Il y a là comme un mirage fin, vibrant, qui danse sur les dits organes. Déjà les dessins de Breschet nous montraient que chaque gerbe nerveuse est anastomosée par des anses nerveuses à la prochaine gerbe, et que toutes les fibrilles nerveuses desquelles chaque gerbe est composée sont à leur tour réunies par d'autres anses multipliées et sans nombre.

Ainsi disposées, ainsi entrelacées, anastomosées à l'infini, toutes ces fibrilles nerveuses constituent un tout uni : le moindre mouvement de l'une doit forcément être aperçu par toute autre fibrille. C'est un prodige ! Un son avant d'arriver au point sensible est distillé à travers la périlymphe tympanique, c'est un premier filtre chimico-physique, et c'est au milieu de ce médium uniforme, que le son montant par la rampe inférieure perdra sa raideur ; et ses angles vifs trop résonnants ou dissonnants seront émoussés.

Le son passé outre la *lagena*, descendant par la rampe vestibulaire continuera dans le même ambiant, la périlymphe, et sera de mieux en mieux monté et épuré. Par la membrane homogène le son transperce l'endolymphe cochléene ou l'abreuve, et un contact mystique sur les dites touches s'opère et par là la vraie planche, ou rampe sentiente, la rampe diatonique, appréhende, attrape, absorbe le son pour le transmettre tout élaboré au vestibule membraneux où les papilles nerveuses du nerf acoustique central en sont instruites pour les emmagasiner, pour les apprendre, et s'en souvenir. Tout cela s'accomplit dans le bulbe acoustique cérébral.

Par plusieurs anatomo-microscopistes, la rampe médiane et sa membrane homogène ont été réconnues, et aussi l'endolymphe de ce canal spiral, mais où cette endolymphe médiane se déverse-t-elle ? Reissner, Huschke, Kölliker et d'autres indiquent que ce canal et son contenu finissent dans le sac membraneux du vestibule, mais ces auteurs si diligents glissent même trop vite sur ce point, et ils ne nous ont pas indiqué ni dessiné aucunement à quel point le tube spiral cochléen avec son endolymphe s'abouche au vestibule.

Il y a là un doute qui devra, par des travaux opiniâtres microscopiques, être éclairé. Par la congélation et avec la loupe, je n'ai rien vu ni constaté, et pourtant ce canal spiral avec son endolymphe ne peut pas rester isolé et flottant tout seul, il doit faire partie intégrante d'un tout. Pouvait-on faire mieux que cela ? et notre cerveau qui contient en lui tant de prodiges, serait-il capable de construire un tel appareil et de tels organes ? La nature est une chose créée, Dieu en est le

[illegible]

[illegible]

[illegible] analogue [illegible] glaucome. Et [illegible] peut faire [illegible] glauco- [illegible] longtemps la [illegible] particulier [illegible] inflammatoire le [illegible] est absorbé, [illegible]. Alors un vide [illegible] se remplir par la [illegible] de la pression atmosphérique. [illegible] détermine le déplacement [illegible] l'enfoncement de l'étrier dans le labyrinthe.

La pression atmosphérique [illegible] dans la caisse pèse donc sur le labyrinthe par l'intermédiaire de l'étrier qui y enfonce.

Dans le labyrinthe, la pression ne peut s'exercer ni sur le liquide incompressible par nature, ni sur les parties osseuses et inextensibles de la paroi; cette pression

s'exerce en fin de compte sur les parties molles de cette cavité, c'est-à-dire sur le nerf acoustique à son entrée dans le labyrinthe, et sur les vaisseaux labyrinthiques.

La valeur de cette pression peut être calculée dans une certaine mesure. Si l'on admet que l'oxygène soit absorbé par les vaisseaux de la caisse, comme l'air renferme 21 parties d'oxygène pour 79 d'azote, il se produira dans la caisse un vide d'un quart d'atmosphère. La pression atmosphérique s'exerçant sur la membrane tympanique, qui chez l'adulte est d'environ 1 centimètre carré, la pression supportée par cette membrane sera égale au poids d'une colonne de mercure d'un centimètre carré de base et de 19 centimètres de hauteur soit 19 centimètres carrés de mercure dont le poids est de $19 \times 13\,D = 247$ grammes, soit approximativement en chiffres ronds 250 grammes. Si une partie de l'azote est absorbée, le vide sera plus important, la pression sur le labyrinthe plus considérable, elle dépassera 250 grammes et s'élèvera proportionnellement au vide de la caisse. L'absorption totale en quelques jours de l'air dans l'emphysème sous-cutané indique la rapidité possible de ces phénomènes d'absorption du gaz aérien.

Le poids brut doit être diminué de la résistance qu'opposent les membranes déprimées. Toute diminuée qu'elle soit, cette pression n'en est pas moins considérable.

Si nous comparons maintenant cette pression auriculaire ou otopiésique à la compression oculaire ou glaucomateuse, on reconnaîtra facilement que la compression otopiésique est plus considérable que la compression glaucomateuse.

En effet, on voit par l'ophtalmoscope, que la compression glaucomateuse est incapable de déprimer complètement les petites artères de la rétine, et cependant cette pression glaucomateuse est suffisante pour déterminer à la longue la dégénérescence du nerf. La pression glaucomateuse est donc moindre que la pression sanguine dans les petites artères rétiniennes. Nous pourrons connaître la tension glaucomateuse quand nous connaîtrons la tension des artères rétiniennes. Voici comment la pression des petites artères peut être approximativement évaluée :

Dans l'aorte, la pression sanguine est d'environ $\frac{1}{4}$ d'atmosphère, soit $\frac{25}{100}$. Dans la veine cave, à son entrée dans l'oreillette elle est tout près de zéro, elle est estimée à $\frac{1}{100}$ d'atmosphère. Les capillaires généraux, placés à mi-chemin supportent une pression intermédiaire, soit $\frac{12}{100}$ ou $\frac{1}{8}$ d'atmosphère, ou 9 à 10 centimètres de mercure. Dans les petites artères, la pression est un chiffre intermédiaire entre $\frac{12}{100}$ tension capillaire et $\frac{25}{100}$ tension de l'aorte. La tension des artères rétiniennes ne peut être supérieure à $\frac{15}{100}$ ou $\frac{18}{100}$ d'atmosphère, ce dernier chiffre représente 14 centimètres de mercure environ.

La pression de ces petites artères étant inférieure à $\frac{18}{100}$, la pression du glaucome, qui est capable de déterminer l'atrophie du nerf optique et qui cependant n'efface pas le calibre des artères rétiniennes, est inférieure à 14 centimètres de mercure.

On voit donc que la pression otopiésique, qui est au moins égale à $\frac{1}{4}$ d'atmosphère et peut s'élever plus haut encore, est également capable de produire sur le nerf acoustique des lésions comparables au glaucome.

La compression otopiésique, avons-nous dit, dépend du vide relatif de la caisse, et le vide est la conséquence de l'obstruction des trompes.

Quant à la cause de l'obstruction des trompes, la plus commune c'est le catarrhe naso-pharyngien à répétition, catarrhe soit accidentel, soit constitutionnel, soit héréditaire. Dans ce dernier cas on en retrouve l'analogue chez l'un des parents et même chez les grands-parents où il y a souvent produit un certain degré de dysacousie, grâce à des attaques multipliées, plus ou moins légères, mais répétées.

L'hérédité du catarrhe naso-pharyngien se transmettant à plusieurs générations successives, permet d'élucider, d'une part, l'origine de la surdi-mutité dans les unions consanguines entre parents affectés l'un et l'autre de catarrhe naso-pharyngien héréditaire.

Un certain nombre de lésions de l'oreille moyenne peuvent surajouter leur action nocive à l'effet physique de la compression du nerf. On les a constatées depuis longtemps. Loin de diminuer la puissance de la cause primordiale, capitale et suffisante de la surdité infantile qui est la pression otopiésique, ces lésions ne sont que des causes aggravantes de la première.

Le traitement a pour but de faire cesser la compression du nerf acoustique en faisant cesser le vide de la caisse. On y arrive par les insufflations d'air dans la caisse et par la perforation de la membrane tympanique.

The Acoustic Potentials of the Human Auricle.

Mr. A. Gardiner Brown, London.

There is much difference of opinion as to the real acoustic value of the auricle, "many authors denying that it has any marked influence on the function of hearing, whilst others consider it as a sound-conductor, sound-condenser, or as a resonator for higher tones" (*Urbantschitsch*). It is to this latter function that I wish to call further attention.

Janfal pointed out that friction on the tragus would produce in some cases the middle C, by reason of the vibrations excited in its cartilage.

In some experiments on the auricle which I have lately tried in musical people, I have ascertained not only that the pitch of the friction-sound on the tragus is as above stated, but that in a well-formed auricle the whole free margin of the cartilage gives a beautifully graduated ascending scale of notes, forming a complete octave from the tragus in front to the posterior border of the helix behind.

The antitragus forms a distinct and isolated note, the E.

The notes, or friction sounds, are produced by passing the finger over the different parts indicated in the diagram, fig 18.

It is very remarkable that the notes forming, as it were, the basis of all music—viz., the *first major triad*, or tonic, are very distinctly produced by friction on the tragus, antitragus, and middle and upper border of the helix successively.

The cartilage of the rim of the helix in a well-formed ear diminishes gradually both in width and thickness from before backwards, and the amount of hollow space formed by the various fossæ allotted to each section of the rim, as marked off in the diagram, diminishes in the same way; these two facts are quite in keeping with acoustic principles. Upon a careful examination of the intrinsic muscles of the pinna, we must be forced to the conclusion that they are serviceable only in increasing the tension, and thus heightening the resonant pitch of the different parts of the cartilage.

The following simple experiment will illustrate this:—

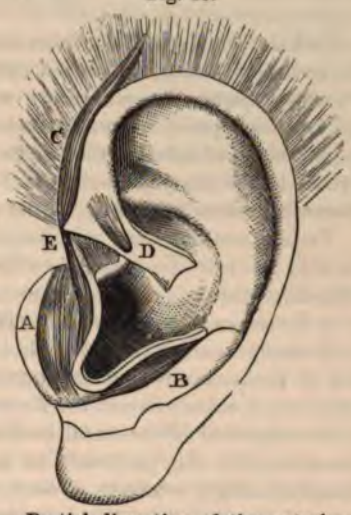
Take an ordinary visiting card, and bend up and over one of its long edges, a quarter of an inch in width, without cracking the card; this edge, upon being rubbed, will give a note; now bend it slightly and at right angles in the opposite direction, that is, across its shorter diameter; as you bend it more and more the

note keeps rising, until it has passed through a complete octave. This is due to increased tension of its edge and tendency to form a nodal point at the intersection of the two bendings.

Fig. 18.

External surface of the auricle, indicating the positions of the friction-sounds referred to in the text.

Fig. 19.



Partial dissection of the anterior surface of the auricle, showing—A, m. tragicus, with E, its occasional elongation to spine of helix. C, m. helicis major. D, m. helicis minor (Henle).

In a similar manner the intrinsic muscles of the pinna increase the tension of the cartilage and nodal points, and so raise the resonance pitch of its various parts.

This will now be shown in detail.

Intrinsic muscles of outer surface.—M. tragicus raises the pitch of the C, and when its fibres reach as far as the spine of the helix it probably also heightens the D above.

M. antitragicus probably sharpens the antitragic E. M. helicis minor and major sharpen the D, E, F, and G.

Intrinsic muscles of posterior surface.—Transversus auriculæ probably sharpens the G, but especially the A, B, C. Obliquus auriculæ sharpens D and E.

The extrinsic muscles of the ear no doubt much assist in the transmission of the vibrations received by the auricle to the inner ear, by rendering more tense its attachment to the head during the act of listening.

Fig. 20.

Posterior surface of the cartilage of the auricle, showing A, m. obliquus auriculæ. B, m. transversus auriculæ (Henle).

[illegible]

(2) But there is a still more useful application of anterior rhinoscopy, simultaneous inspection and catheterism, and I wish to call your attention specially to this combined method. Its execution is very simple. The bivalve dilating speculum is applied to the patient's nostril, and maintained with one hand leaning against his nose. Daylight, or better, the strong light of a gas-burner, is thrown deeply into the nasal fossa by means of the forehead reflector, a method familiar to every aurist. Operating thus in a brilliantly illuminated space, the catheter avoids easily the prominent obstacles which encumber its way.

I have now used this system for several years, and owe to it so much facility in catheterizing difficult cases, that I cannot but strongly recommend it to the profession. With this combined method, I have been able to catheterize successfully in cases where experienced hands had failed, and where I hasten to say I should have probably failed too, but for this effective method.

As to the amount of pain, the difference between the ordinary way and the one I propose is such, in these difficult cases, that the patient imperiously claims the employment of the combined application in subsequent operations.

Amongst the obstacles in the nasal passage which this method makes us avoid, there is a special one which, in my opinion, is most frequently the cause of difficulty: this is deformity of the septum narium, not so much the large deviations of this partition, but a peculiar anomaly, very frequent, which I have recently described in a paper on the treatment of simple chronic coryza.* This anomaly consists in the existence of horizontal protuberances of the septum, implanted where vomer and cartilage join. These prominent growths direct themselves outwards, often so far as to reach the lower turbinated bone. Sometimes, they are isolated and pointed; often, on the contrary, they extend as a kind of crest horizontally along the septum.

In my opinion this anomaly forms the most frequent obstacle to catheterism, as far as introducing the instrument through the nose is concerned. According to my experience, hypertrophied turbinated bones, or even mucous polypi, seldom form a serious hindrance, as their surfaces generally yield under a gentle pressure, sufficiently to let the catheter pass.

When the instrument, on the contrary, is introduced in cases of septum protuberance, its point being turned downwards, as usually, its curved part immediately strikes against these growths. Then not only the operation cannot be continued, but extreme pain is caused by the pressure, the lining of these protuberances being compressed between their hard substratum and the catheter.

When combined with catheterism inspection not only shows us the obstacle, but teaches us at once how to avoid it. The obstruction exists here especially in the vertical direction, the important one in catheterism. Well, guided by the eye we turn the point of the instrument sidewards and outwards at an angle of about 90° and not of 180°, as often recommended as "tour de maître." 90° are sufficient to place the principal dimensions of the instrument in the horizontal direction, where, under these pathological circumstances, it finds more room than in the perpendicular one.

In cases of very greatly hypertrophied and exceptionally resistent lining of the lower turbinated bone, even this method meets with difficulties when we use the common forms and sizes of catheters. But these difficulties disappear by choosing

* B. Loewenberg, Contribution au Traitement du Coryza Chronique Simple: *Inst. Union Médicale*, 28 Juillet, 1881.

a very short-pointed form, which I have used many years in narrow nasal passages or pharynx. Sometimes I was even obliged to employ a special form I had made long ago in a very difficult case, a form in which the point starts from the instrument at a right angle.

I conclude these remarks by recommending in all cases of ear disease the practice of ocular exploration of the nasal fossæ previously to catheterism; and in cases where the afore-named or other malformations are met with, to use the very easy method of combining inspection with catheterism. This method hitherto has enabled me to catheterize, in each case, the ear by the corresponding side,—a thing, I believe, preferable to passing through the opposite one, on account of the difficulty of inserting the catheter in the opening of the Eustachian tube lightly enough to practise effective inflations.

I would venture to say this method will be successful in every case; but I prefer leaving the decision to the distinguished confrères here present.

Ueber ein flüssiges, künstliches Trommelfell.

Dr. T. Michael, Hamburg.

Zu künstlichen Trommelfellen vermittelst welcher man bekanntlich bei manchen chronischen Perforationen ausserordentliche Gehörverbesserungen erzielen kann, sind bisher stets feste Körper, Goldschlägerhäutchen, Gummiplättchen, Papier, Wattekügelchen verwendet worden. So vortrefflich zuweilen deren Wirkung ist, so verbietet sich sehr häufig ihre Anwendung durch den Umstand, dass sie von den Patienten gar nicht oder nur kurze Zeit ertragen werden, und subjective Geräusche, Schmerzen oder Schwindel erzeugen. Um auch solche Patienten, und zwar ist dies die bei weitem grössere Zahl nach meinen Erfahrungen, welche diese Apparate nicht ertragen, die Wohlthaten des künstlichen Trommelfells geniessen zu lassen, ersetzte ich die festen Substanzen durch eine Flüssigkeit, nachdem ich die auch bereits von Toynbee und Tröltsch beobachtete Thatsache verwerthete, dass derartige Patienten oft wesentlich besser hören, wenn ihnen nach dem Baden oder dem Ausspritzen des Ohrs etwas Wasser im Gehörgang zurückgeblieben war. Die Beschreibung meines Vorgehens knüpfe ich an die Erzählung des nachfolgenden Falles:

E. J., 20 Jahre alt, leidet in Folge von Scharlach seit 10 Jahren an doppelseitiger Perforation mit geringem Secret und hochgradiger Schwerhörigkeit. Er war von verschiedenen Aerzten mit Adstringentien und Lufteinblasung ohne jeden Erfolg behandelt worden. Ich versuchte das Wattekügelchen. Rechts blieb dasselbe erfolglos, links hatte es eine vorzügliche Wirkung. Es wurde indessen kaum eine Minute ertragen, erregte Schmerzen und Schwindel und musste daher entfernt werden. Da der Patient angab nach dem Baden oder Ausspritzen wesentlich besser zu hören und ich darauf die Hoffnung begründete ihm zu helfen—so machte ich folgenden Versuch: In ein bleistiftdickes—unten zugeschmolzenes Glasröhrchen goss ich einige Tropfen Collodium elasticum. Nach einer Viertelstunde überzeugte ich mich, dass sich die Flüssigkeiten nicht vermischt hatten sondern, dass das Collodium eine dünne Haut auf dem Glycerin gebildet hatte, so dass man jetzt das Röhrchen umkehren konnte ohne die Flüssigkeit zu verschütten. Jetzt verfuhr ich in derselben Weise bei dem Patienten. Mit einem Augentropfglas liess ich tropfen-

weise Glycerin ins Ohr fallen, machte zwischen den einzelnen Tropfen Gehörprüfungen, bis ich mich überzeugte, dass weitere Verbesserung nicht erreicht wurde. War es etwas zu viel geworden, so zog ich mit Watte wieder etwas heraus. Nun fügte ich in derselben Weise einige Tropfen Collodium elasticum hinzu und liess den Patienten, auf die rechte Seite gestützt, eine Viertelstunde sitzen. Der Erfolg war ein ausserordentlich befriedigender. Während man vorher dem Patienten laut ins Ohr hineinsprechen musste um sich verständlich zu machen hörte, er jetzt Flüsterstimme auf 3½ Meter und die Uhr, die er vorher beim Andrücken nur schwach gehört hatte, auf 30 Cm. Irgend eine Empfindung eines fremden Körpers hatte er nicht, war überhaupt in keiner Weise genirt. Nach der zweiten Application, die erste war noch nicht so dauerhaft gemacht, konnte ich noch nach vier Tagen die Dauer des Erfolgs constatiren. Indessen spritzte ich doch das Vorhandene aus, da ich hinter der Collodiumhaut deutlich Eiter durchschimmern sehen konnte. Um nun zugleich die Eiterung zu behandeln, setzte ich dem Glycerin etwas Tannin hinzu und konnte nun nach weiteren vier Tagen das Fehlen jeder Eiterung constatiren.

Die Wirkung erklärt sich wohl in der Weise, dass die Schallwellen von aussen auf die Collodiumhaut gelangen, und von dieser durch die Flüssigkeit ohne Benutzung der muthmasslich defecten Gehörknöchelchenkette, und ohne zwischen Luft und festen Körpern abwechseln zu müssen, auf die Stapesplatte und das foramen rotundum übertragen werden.

Ich glaube, dass die beschriebene Methode nicht nur zum Ersatz der bisherigen festen künstlichen Trommelfelle (eine einfache Collodiumhaut ist vollständig wirkungslos) zweckdienlich ist, sondern hoffe in derselben auch ein Mittel gefunden zu haben, welches uns in den Stand setzt chronische Otorrhöen wirksam zu behandeln. Bei lang dauernden Otorrhöen mit geringer Secretion, wird es gewiss für viele Fälle passend sein, die Schleimhaut in dauernden Contact mit einer adstringirenden oder desinficirenden Substanz zu bringen. Die bisherigen Methoden erfüllen diesen Zweck in unvollständiger Weise. Die flüssigen Medicamente fliessen heraus, ebenso die Gelatinepräparate. Die Pulver sind bald aufgelöst oder bilden schwer entfernbare Krusten mit dem Eiter. Durch Anwendung einer Verbindung des Glycerin mit einem, dem Fall entsprechenden Medicament wie Tannin, Jod, Jodkali, Carbol oder Salycil—Säure, und Bedecken mit Collodium sind wir im Stande zugleich die Schleimhaut von der Luft abzuschliessen und sie der fortdauernden Wirkung des Medicaments auszusetzen. Mittheilungen über den Effect dieser Behandlung behalte ich mir für spätere Arbeiten vor.

DISEASES OF THE TEETH.

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INAUGURAL ADDRESS,

BY THE PRESIDENT,

EDWIN SAUNDERS, ESQ.

GENTLEMEN,—Before assuming the duties and responsibilities of President of the Odontological Section of this great Congress, permit me to thank you for the honour you have conferred upon me in electing me to that high office; and let me assure you that it will be my earnest endeavour to justify your choice, however I may fail to satisfy my own, and your, well-warranted expectations. And, indeed, were it not that I am sustained by the kind co-operation of two Vice-Presidents and a Secretary, in whom our profession feels a just and legitimate pride, I might well feel oppressed by the onus of doing full justice to the position on so august an occasion. Nor was it, I am free to admit, until I had the permission of the Executive Committee to call around me, as a Council, some old and tried associates in professional work, that I began to experience the requisite energy and confidence. And having made this personal avowal and confession, I turn to the distinguished company before me, who have done us the high honour to visit our too great, but not too gay, capital, and to become for a short time, and for our signal profit, our guests at this great intellectual banquet.

Et à vous, Messieurs les Etrangers, je désire, au nom des Membres Anglais du Congrès, au nom de notre plus grande Société, La Société Odontologique de la Grande Bretagne, au nom de la profession même en Angleterre, vous souhaiter la bienvenue.

Croyez Messieurs, que nous sommes très sensibles de l'honneur que vous nous avez fait en visitant à ce moment notre trop grande, mais pas trop gaie ville de Londres, et croyez que c'est notre désir de vous rendre la visite, à une fois, agréable et fructueuse.

Permit me, gentlemen, on behalf of the English Members of the Congress, on behalf of our largest Society, the Odontological Society of Great Britain, now in the 25th year of its somewhat chequered, but, on the whole, prosperous existence, and on behalf of the whole body of the dental profession in England, to offer you a hearty welcome, and to assure you of our earnest desire to render your too brief visit both profitable and pleasant. We hail the happy occasion of our friendly intercourse, and we trust that friendships begun under such benign auspices may continue and progress in interest through many prosperous years. Such gatherings as these, with the pleasurable amenities they involve, do much to soften and refine the manners, to quicken the intellect of all concerned, and to remove misconceptions of national or individual character, which are apt to be engendered by isolation and want of friendly intercourse. Congresses, such as that at which it is our privilege at this time to assist, serve a great social purpose, apart from the intellectual and scientific aims at which they are more immediately directed. It is much that they afford an opportunity and a stimulus for intellectual effort, which might otherwise, with man's proverbial procrastination, never be called into action. But in these days of an ever-teeming press, and of facilities for the free inter-communication of ideas, this is subordinate to the advantage of personal knowledge of the individual, and the living interchange of thought. The modern Congress, which seems now in high favour, owes its existence, or shall it not be said, its revival, to the intellectual activity, joined with a wide eclecticism, which is a characteristic of our times, and which seeks to assimilate to itself whatever is of value in the past or in other lands, whether in social manners and customs, in matters of dress and daily life, in schools of architecture, or in the realms of science and art. The generally accepted idea of a Congress is, if I mistake not, more than a fortuitous assembly of persons engaged in similar pursuits and drawn together by community of thought and interest. It is the deliberate coming together of distinguished men, or of experts, of set purpose and for a specific object; the persons constituting the Congress being invited and selected with a due regard to their knowledge of the subject, for the consideration of which it has been convoked. This is especially evident in political affairs, and notably in a recent instance in a northern capital, where the great countries of Europe, represented by their most distinguished statesmen and diplomatists, met in solemn conclave for the rectification of national frontier lines, and for the determination of other questions of vital importance, which must otherwise have been left to the rude arbitrament of the sword. And may we not indulge the hope, in the interests of an enlightened humanity, that this high function may be more extensively employed to interfere between the unbridled ambition and lawless rapacity of States, more powerful than just, and the resolute resistance to subjugation or spoliation on the part of the oppressed, protracted, it may be, to the bitter end, through years of carnage and misery? So might the world be spared the saddening spectacle of "man's inhumanity to man," and the fair page of contemporary history be unsullied by the foul blot of the blood-stained record. Ours, however, is a Congress of peace, and we are happily not called upon to compose animosities or to adjudicate upon conflicting claims. The triumphs which we are met to celebrate are those of man's skill in limiting and repairing the ravages of disease; our victories, those over Nature herself, when she is forced to yield up another of her secrets as the reward of patient research or of well-conducted experiment. Our international reunion may be regarded as a periodical taking stock of the gains of science, of improved appliances, of more accurate means of diagnosis, and of more efficient modes of treatment in the various departments of medical practice. And for the better and fuller carrying

out of this intention, it has been found advisable, having regard to the present advanced state of medical and surgical science, to divide the work of the Congress into Sections.

These Sections carrying on their work simultaneously, and the work of each Section being complete in itself, greater fulness and accuracy of detail are secured without any sacrifice of the unity of the one grand result, as the work of each Section is the necessary complement of the whole. In that with which we are more immediately concerned, one of the youngest departments of surgical practice, and which for the first time enjoys its own distinct and prominent position, considerable interest will attach to the question of education, and the regulations which in each country govern the entrance into the profession. The former part of this very important subject will, I trust, shortly be brought under the notice of the Congress by one than whom none is more fully informed, and more entitled to speak with authority, I mean Mr. John Tomes, who has in this direction, during the last quarter of a century, done much to advance the interests, and to establish a strong claim on the gratitude of, the profession. Nor would the English sense of justice and fair play be satisfied without an acknowledgment of the more recent services of his colleague in this good and great work, Mr. James Smith Turner, without whose unsparing devotion of time and energy it could not have been brought to so successful an issue. To the joint action of these two gentlemen; to the lawyer-like precision and forethought of the former, no less than to the vigilance and promptitude of the latter, is the profession indebted for that invaluable piece of legislation, the Dentists' Act of 1878. It must not be forgotten, however, that, to our foreign friends, the nature of the enactment is of greater interest than the means or the persons by whom it was obtained. By the provisions of this Act then, which came into operation on August 1st, 1879, it is forbidden to any one to use the word Dentist, Dental Practitioner, or other title implying that he is qualified to practise Dental Surgery, unless his name appears on the Register of that body; thus giving to the Dentist the same protection and privileges as are enjoyed by the Physician and Surgeon in this and other countries. By this measure the opprobium was removed which so long rested on the dental profession in this country, that it included a large proportion of ill-qualified practitioners, and in many cases persons who were unsuccessful in other pursuits, and who were attracted to it by the absence of restrictions or of preliminary examination. By the provisions of this Act, introduced by Sir John Lubbock, not only are the public preserved from the extortion and malpraxis of the ignorant and unprincipled, but a grave discouragement is removed from the educated and honest practitioner. For it is only in human nature that high aims and honest zealous work should languish in the atmosphere of indifference and lack of appreciation. In thus obtaining legal sanction for the organization of the profession, it was desired strictly to maintain its connexion with the Royal College of Surgeons, as it was rightly felt that separation from that body would involve abdication of the status which it had hitherto enjoyed. And when the College had been memorialized on the subject, showing that the curriculum for the diploma for general surgery, which was the only qualification then open to him, did not comprise certain matters of the first importance to the dental practitioner, that, in fact, the entire subject of Dental Surgery found no place either in the teaching, or at the examining board, an arrangement was accepted for more fully meeting the requirements of the case. Accordingly a conjoint board of examiners, consisting of half surgeons and half specialists, was created for the licentiateship of Dental Surgery, with a corresponding modification of the prescribed course of study, eliminating much that was of little value, and substituting what was regarded as specially necessary in that particular line of practice. Thus, by varying, not by lowering, the educational standard, an arrangement has been effected, which if not in all respects perfectly satisfactory, goes far to meet the reasonable views and wishes of those who have the welfare

of the profession at heart. With this bare outline of our proceedings, in reference to the organization of the profession, before us, we shall listen with interest to what has been accomplished in other countries in the same direction, not, it may be hoped, without mutual profit and advantage. Gentlemen, I feel that I ought not longer to tax your attention, but having declared this Section of the Congress open, that we shall prepare ourselves to listen with appreciation and enjoyment to those varied and valuable contributions to the literature of our speciality with which we are so liberally favoured both from home and foreign sources. And first your attention will be asked for the always welcome utterances of one whose contributions to science during a long series of years, many of them having a direct interest for our own speciality, and almost unparalleled for number and value, have made his name a household word in both hemispheres. I mean, Professor Owen. We feel grateful for his presence here to-day, which will confer prestige on our proceedings, and we tender him, with our thanks, our sincere felicitations that he has been able to witness, in unimpaired health and energy, the realization of his hopes and wishes in the completion of that noble structure, the Museum of Natural History.

On the Scientific Status of Medicine.

Professor OWEN, C.B., London.

In response to an appeal from our President, I replied that the subject of an "address" from me would be a general one—viz., "On the Scientific Status of Medicine." It was, in fact, the only one which my leisure, and reflections on the main aim of the "Congress," would enable me to prepare for any occasion on which I might be honoured by a call to take part in the work of the "Sections" to be constituted by the "General Meeting" of the International Medical Congress. Having been favoured by a notice that such subject would be acceptable, and that it would be received at the present time and place, I proceed to ask the indulgent attention of the Section to a subject which may seem to be but remotely related to its speciality.

The aim of every student of medicine—and such the true physician never ceases to be—is to raise the healing art to the status of a science.

The most significant testimony that the application of human intellect to comprehend phenomena has attained its noble aim, is the "power of prediction."

When the astronomer foretold the date, to hour and minute, of the advent of an eclipse, or of a comet, or of a cluster of seemingly vagrant aërolites, his peaceful victory was manifest. So, when the palæontologist, on inspection of a new-found fragment of tooth bone, proclaimed the nature and affinities of the extinct animal which, long ages past, had left such petrified evidence of its existence, his methods of "Interrogating and interpreting Nature" were acknowledged to be of the rank of a science.

Certificates of life assurance offices,* and bulletins issued by the medical attendants on personages in whose life and health the public have interest, are among the forms of prophecy in the precise fulfilment of which the claims of medicine to a like rank may be tested. The definition of disease is the expression of a sum of knowledge and experience by which the constant and essential characters are distinguished from accessory and

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* Mr. A. H. Smee, M.R.C.S., F.C.S., &c., in his "Hunterian Oration" of February 9th, 1881 (before the "Hunterian Society of London"), affirms from his experience as medical adviser to an "Insurance Office" receiving 1,000 certificates annually :—"I have noticed from year to year the number of cases in which, if the *diagnosis* of the medical attendant was right, his *prognosis* was manifestly wrong."

occasional symptoms; the remedies applied are, in like manner, those which experience has proved to be most potent to their end. The technical terms of maladies, so discerned, are, as a rule, "collective names," for groups of morbid symptoms.

Permit me to trespass on your patience, and crave your indulgence toward one who has long ceased to practise the profession—deemed divine by sages of ancient Greece—if he ventures to submit a few examples illustrative of the dependence of medicine upon a once deemed unpromising inlet of light; but of which, in researches connected with the branch of curative science of the present Section he has availed himself with unlooked-for advantage in relation to the subjects of the Section of Medicine.

The healer may be called in to one whom he finds suffering from "loss of appetite, discomfort and weight in the gastric region, distension of stomach with eructations and nausea." To this group of symptoms he applies the name dyspepsia: if aggravated by aching or burning pain referred to the pit of the stomach, he may term it gastrodynia.

According to such symptoms or indications he may prescribe, for one class, "carminatives," for another, "alkaline carbonates in effervescence;" or he may be led by special indications to exhibit such drugs as "nitrate of silver," "hydrocyanic acid," "bismuth," and "opium"—the latter especially if pain be attended with spasmodic action.

If the physician be called to a case in which "the alvine evacuations are excessive in quantity and unnatural in quality" and sums up such symptoms as "diarrhœa," he may exhibit castor oil or saline "purgatives" followed by various "astringents" vegetable or mineral.

But should a patient, whom the healer may see for the first time, be suffering, also, from "febrile or pyrexial symptoms, thirst and headache, tenesmus and tormina, with rigid abdominal walls, frequent and uncontrollable calls to defæcate, with little discharge save of watery mucus of peculiar fœtor, perhaps stained with blood,"—he pronounces the case to be one of dysentery;" and may prescribe leeches to the abdomen, fomentations; and, according to one authority, may exhibit "purgatives," but, according to another, "opiates." In a late excellent compendium of practice it is written of this disease: "Calomel is said to have fallen into disuse and, perhaps, deservedly."*

An eminent physician, Dr. Trousseau, has confidence in ipecacuanha.

Again, the aid of the medical man may be invoked to abate or banish a group of symptoms which he terms "peritonitis." And, under his treatment there may supervene, without the least obvious evidence of causation, another series of sufferings: pain during respiration, dyspnœa, calling for leeches to the chest, counter-irritants, as mustard-plaisters, flannel-rollers and compresses, opiates—in short, the recognized remedies for "pleuritis."

And these symptoms may be aggravated by those of "pneumonia," requiring other or added modes of treatment; moreover, the pulmonary symptoms may become further complicated by abnormal affections of a more vital organ—the "bosom's lord."

If pain and oppression in the region of the heart predominate, with accelerated pulse, and, if acoustic scrutiny be superadded to vocal and visual interrogations, the accomplished physician may be able to pronounce the malady to be either "pericarditis" or "endocarditis." In either case he will prescribe the appropriate remedies, and form, according to their effects, his prognosis or prophecy of results.

Should diffused muscular pains supervene, or be associated with peri- or endo-cardial symptoms, and these pains be attended with stiffness, loss of muscular power or repugnance to exert such power, and the physician happen to be invoked at this stage, he

* Bristowe, "Theory and Practice of Medicine," 8vo, 1878, p. 683.

may pronounce it to be a case of "rheumatismus," perhaps, "acutus," and his treatment will be guided by the urgency or the predominance of one or other of the symptoms. But the intractability of the so-called malady is significantly indicated by the expressions of one of our most accomplished physicians, under whom I was myself a student, and whose loss was deeply regretted and is still lamented by his survivors.

Dr. Peter Mere Latham, in his lectures on subjects connected with clinical medicine—in which in relation to practice and instruction he was a master—writes of acute rheumatism as follows: "No disease has been treated by such various and opposite methods. Venesection has wrought its cure, and so has calomel, and so has opium, and so have drastic purgatives.*

Had Mere Latham, at the date of that "lecture" been aware of a subsequently discovered cause of "acute rheumatism," he would have known that at such stage of the cause's baneful operation, the so-called malady was beyond the influence of any of the proposed and supposed remedies. But, without knowledge or suspicion of such cause, and noting an abatement of symptoms as time went on, bringing with it a transition from *rheumatismus acutus* to *rheumatismus chronicus*, the physician might well attribute the cure of such symptoms to one or other of the remedies which in the then stage of curative art such experience had suggested.

In a modified form of muscular malady to which the term *rheumatismus arthriticus* has been applied, and which, at a dropsical stage, proved fatal, a justly celebrated Professor of Physiology in the University of Heidelberg observed, in the post-mortem examination, that the muscular tissues of the defunct were studded with minute white specks which quickly blunted the scalpel. The chemical analysis by Professor Gmelin showed the grittiness to be due to deposits of phosphate and carbonate of lime, and Tiedemann consigned the facts to Frorieps' *Notizen* for 1823: the case was held to be a previously un-noted instance of "arthritis diffusus." Professor Tiedemann was little aware how near he was to a discovery to which he might—most probably would—have been led by application of the microscope. Some years later, Mr. Hilton, then Demonstrator of Anatomy at Guy's Hospital, and Dr. Addison, Physician to the Hospital, gave a joint account of a similar pathological state of the muscles in a subject brought in for dissection. They detected the cellular or cyst-like form of the seat of the salts, which cysts the demonstrator referred to a species of echinococcus, or hydatid, and the physician, on the results of experiments, to the larvæ of some small fly (dipterous insect).†

The finding of a wormlet within the cysticule,‡ in 1835, and the more important discovery by Dr. Zenker, of Dresden, in 1860, of its causative relations to a direful disease, have demonstrated that the several groups of symptoms to which I have briefly referred, under their respective technical denominations, may, one and all, be due to the deglutition of the Trichina spiralis. The larva of this wormlet in the flesh of the animal it infests being introduced into the human stomach, finds in that warm cavity an environment of muco-chymous nutriment, in which it rapidly matures, acquires activities, and develops its generative organs and products. If permitted to pass into the intestinal canal it there extrudes its progeny, which, also, rapidly acquire their full size and procreative faculty. But the graver symptoms of their presence are due to the curious migratory instinct of the young trichinæ, which impels them to make their escape by perforating the tunics of the intestine, in the course of which operation the majority find their way into the venous capillaries.

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* *Op. cit.* Lecture x. "Diseases of the Heart."

† *London Medical Gazette*, vol. ii. 1833.

‡ *Proceedings of the Zoological Society of London*, 8vo. February 24, 1835.

Such as wriggle through the meshes of the vascular network, bore their way through the serous tunic of the gut, and pass into the abdominal cavity: whereupon the "peritonital" are complicated with the "enterital" symptoms. But the majority are carried to the right side of the heart, and thence, by the pulmonary artery, to the lungs. Threading, then, the capillaries continuous with the commencement of the pulmonary veins, the Trichinæ are brought back to the heart. As many as may have burrowed into the muscular walls of the right or of the left ventricle, or may have made their way into the cavity of the pericardium, give rise to the symptoms summed up in the terms of art already cited.

Trichinæ which may have strayed into the tissue of the lungs, or which may have wriggled through the pulmonic serous covering, and from the pleural cavity may have invaded the serous membrane in their way to the intercostal muscles, add the "pleuritic" and "pulmonic" to the "pericarditic" symptoms."

The natural affinity or attraction of the Trichinæ is to myonine, or the muscular tissue. There their wanderings end. They are conveyed so soon and so rapidly by branches of the carotids to the muscles of the larynx that the Trichinæ are there found most constantly and abundantly; but usually, so vast is their number, that they are carried to the voluntary muscles of the entire body. In the exceedingly delicate connective tissue of the ultimate bundles of the ultimate fibrils, the young Trichinæ coil themselves up to their larval repose, exciting no other organic change than outflow of plasm, which condenses with the contiguous cellulosity, and becomes moulded into the shape of an elliptic case, in which may be seen, under the microscopic compressorium, one or more of the tiny worms disposed in two or more coils.

The natural history of Trichina spiralis leads the physician, cognizant thereof, to put a question to his patient, the reply to which would reveal the veritable cause of the malady at whichever of the stages—dyspeptic, dysenteric, peritonitic, pleuritic, pneumonic, carditic, or rheumatic—he might happen to have been called in. That question would be, "What did you eat last before you became unwell?" If the answer denoted pork in any of its culinary forms, the physician would require a portion of the meat, or ham, or sausage, and, being practised, as every competent medical man now is in the use of the microscope—an instrument as indispensable to the consulting-room as the stethoscope—he would detect the minute parasites, and so recognise the *fons et origo* of all and every the groups of symptoms personified under one or other of the several before-cited terms of medical art. If, fortunately for the patient, he were called in at the first stage, ere the wormlet had passed on out of the stomach, he might ask for the mustard-pot, and therewith, or with any other quickly-attainable strong and active emetic, clear the stomach of its lethal invaders; after which he might administer a strong dose of calomel, knowing its destructive operation on any lingering Trichinæ which might not have been so dislodged. If the aid of the scientific healer had not been invoked until the dysenteric symptoms had set in, still he might see a chance of directly combatting the *vera causa* by combining the calomel doses with the remedies which accessory symptoms would call for. On the supervention of the pulmonary or cardial trouble the physician would know, with a science enabling him to prophesy, that he could do no more in the way of cure of the malady,—*i.e.*, in eradication of its cause—but that his treatment henceforth must be merely palliative. He could now predict confidently to his patient or the friends that symptoms of pleurisy or pericarditis would set in, and that the chest-symptoms would be followed by rheumatic—probably severely rheumatic—ones; furthermore, that if life were preserved until these symptoms should subside, a certain deterioration of muscular power, with general stiffness, would long remain, if it were ever lost.

The prophet would know that when such stage of recovery was gained, although the wormlets would die and dissolve, their cysts would arrest and precipitate salts of lime, such as attracted the attention, but misled the conclusions, of the justly-celebrated anatomist and physiologist already cited.

My aim, as may perhaps have been surmised by the distinguished members of the noble profession of medicine whom I have the honour and privilege to address, has been to exemplify under what conditions and in what proportion medicine may be termed an art, and under what circumstances it rises to the dignity of a science. In the degree in which the veritable cause of groups of symptoms summed up as "dysenteris, pneumonia, rheumatismus," and other species of disease, is recognized, and the remedy specially applicable to the removal of such cause has been experimentally determined, the applier of such knowledge to the relief of suffering mankind exerts a power which science imparts.

The technical terms in which the symptoms of one or other of the four or five stages of trichinosis would have been defined prior to the discovery of their veritable causes; when, also, under the same pre-trichinal condition of knowledge, various causes might have been assigned, and the then approved legitimate remedies applied to the respective groups of symptoms, exemplify a stage of medical research which has not risen above the level of an art. But this is by no means meant to apply to the knowledge and experience brought to bear upon groups of symptoms independent of a trichinal cause; yet a significant evidence of the scientific status of medicine will be manifested when specific names of disease indicate the "cause," and are founded on demonstrative knowledge of such. The recognition of the efficient cause of the several symptoms, and the relations of these to the anatomical structures affected by such cause, exemplifies a rise to the dignity of a science.

"Knowledge is power:" but what of half-knowledge?

Microscopic discovery of an otherwise invisible parasite has enabled the practitioner to exhibit the remedies applicable to arrest or annihilate the cause of a direful malady; such knowledge gives also that of the stage beyond which there is no specific or direct remedy. In such phase of medicine he can act with confidence, and prophesy with certainty.

Finally, I would refer to another test, which, by the analogy of established sciences, bears upon my present subject. When chemistry was struggling to its goal, a mockery disguised in its rags obtained the confidence of a majority, under the name of "Alchemy," it was long ere the professors of this pseudo-science lost the patronage of the rich and great, on whose credulity they fattened.

The extinction of the "transmutors" is an evidence, small, indeed, but significative, of the true and trustworthy status of the branch of knowledge to which the gifted, single-minded men devoted themselves to raise chemistry to the status of a science.

Prior to and for some time after the promulgation of the Copernican theory, astrology continued to hold its ground against astronomy. The "caster of nativities" was patronized by monarchs, State-ministers, men of wealth, and lords of fair estates long after the period disgraced by the persecution of Galileo and by the cold neglect of Kepler. Finally arose a Newton, and to the higher evidences of a "science" of the stars, I may add here the lower one of the relegation of the astrological quackery to some obscure almanack.

Are there, at the present time, practitioners, professors of curative methods, analogous in the actual phase of "medicine" to the astrologer and alchemist at given periods of astronomy and chemistry? Do they, in like manner, obtain countenance and support as did those empirics from non-scientific people in eminent social positions?

In the degree in which the uncertified dentist, the bone-setter, the mesmerist, the homœopathist, may flourish and get means of existence, may be estimated the stage at which inductive medicine has reached in its rapidly advancing career to the status of a true and established science.

De l'état actuel de la greffe dentaire par restitution appliquée à la cure de la périostite alvéolaire chronique du sommet.

Dr. S. Magitot, Paris.

La communication que je vais avoir l'honneur de vous faire est tout entière contenue dans les trois tableaux que je mets sous vos yeux et qui la résument d'une manière complète.

Je n'ai donc point l'intention de vous faire ici l'histoire complète des greffes appliquées aux dents; loin de là, et mon sujet est beaucoup plus limité.

Je ne veux vous entretenir ici que d'une certaine catégorie de greffes, la greffe par restitution appliquée aux cas déterminés par notre titre.

C'est encore à Hunter qu'il faut remonter pour trouver la première mention d'une semblable opération. Il en indique les termes exacts, et en formule même très nettement les indications,* seulement il ne paraît pas y ajouter une foi bien vive; il dit même l'avoir vue ordinairement suivée d'insuccès et il ne semble pas qu'il l'ait personnellement essayée.

La première tentation appartient réellement à Delabarre qui en 1820 ayant pratiqué l'ablation d'une dent carié d'abcès et de fistule, fit la résection d'une partie de la racine et la réimplanta avec un plein succès.†

La seconde est due à un chirurgien français, le professeur Alquié de Montpellier. Ayant, en 1853, reçu, à plusieures reprises, dans son service d'hôpital, un soldat atteint d'une fistule de la fossette mentonnière rebelle à tout traitement, il eut l'idée d'enlever une incisive inférieure que le stylet venait heurter au fond de la fistule; il fit la section du sommet reconnu malade et la réimplanta.

Le malade sortit guéri huit jours après.‡

En 1870, deux chirurgiens de l'hôpital St. Barthélemy de Londres, MM. Coleman et Lyons répétèrent cette opération; leurs observations très courtes et assez peu démonstratives, comprennent 14 cas dans lesquels il y aurait eu 9 succès. Les autres se terminèrent par suppuration et élimination de la greffe.§

Nos expériences personnelles remontent à 1875. Les trois premières ont été publiées à cette époque,‖ d'autres figurent dans la thèse de deux de nos élèves, MM. Pietkiewicz et David.¶ Elles comprennent dans leur ensemble une durée d'environ six années, et reposent sur un nombre déjà considérable. Mais pendant cette période, d'autres observateurs en ont signalé des exemples.

Ainsi, notre collègue, M. Théophile Anger l'a pratiquée chez une jeune fille de 20 ans,

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* "Traité des Dents," traduction Rochelot, t. xi. des œuvres complètes, p. 109.

† *Annales du Cercle Médical*, Paris, 1820. Premiere partie, p. 323.

‡ Clinique du professeur Alquié de Montpellier. Observation recuellie par le Dr. Planchou: *Bulletin de Thérapeutique*, 30 Mai, 1858.

§ *Transactions of the Odontological Society of Great Britain*, London, 1870.

‖ *Gazette des Hôpitaux de Paris*, 1875, p. 35 et suivante.

¶ Thèses de Paris, 1876 et 1877.

et guérit ainsi en quelques jours une fistule du menton datant de 2 années.* Récemment M. Terrillon a également tenté l'application de cette méthode sur une jeune fille atteinte encore de fistule cutanée ancienne du menton. Une incisive grisâtre, mais sans carie, fut extraite par lui, réséquée dans une étendue de 3 millimètres du sommet puis réimplantée. La dent se consolida très vite, et la fistule était en voie de guérison, lorsque la malade fut perdue de vue.†

Enfin le Dr. David poursuivant les études consignées dans sa thèse inaugurale, en a recueilli 20 nouveaux exemples avec un seul insuccès.‡

Aujourd'hui le nombre de nos opérations personnelles dépasse le chiffre de 100, et l'on verra plus loin comment se répartissent les 100 premières. Elles constituent en tous cas une véritable méthode chirurgicale, dont nous pouvons tracer les données principales.

L'indication chirurgicale de la greffe, combinée à la résection repose essentiellement sur le diagnostic d'une lésion spéciale de l'extrémité radiculaire des dents, se caractérise par la périostite chronique du sommet, inflammation du feuillet périostique, dénudation et nécrose du cément sous-jacent, résorption de l'ivoire, etc. C'est une sorte de mortification partielle de la racine et qui est en dehors de toute tentative directe de guérison.

Ce diagnostic est d'ailleurs ordinairement très facile, en considérant le processus morbide qui consiste dans une série d'accidents particuliers bien connus des chirurgiens, ce sont des phlegmons du bord alvéolaire ou de la face, la dénudation et la nécrose partielle du maxillaire, des fistules muqueuses ou cutanées. Nous n'avons pas à insister ici sur des phénomènes, car il faudrait tracer une description de l'histoire de la périostite, affection souvent sérieuse, quelquefois grave, puisque par son intensité ou ses complications, elle peut mettre en question la vie des malades.

Le but thérapeutique en présence d'une lésion ainsi définie est la suppression du sommet radiculaire mortifié, qui joue le rôle d'épine inflammatoire.

Or, cette suppression n'est que bien rarement réalisable directement.

Nous l'avons faite, toutefois dans un cas, grâce à un vaste clapier alvéolaire dans lequel une pince de Liston a pu être introduite, et réséquer en un seul temps le tiers environ de la racine malade. La guérison s'ensuivit très rapidement.

Dans un cas analogue M. Péan, en 1872, avait pratiqué de même directement la section d'un sommet de racine dentaire qui entretenait une fistule.§

Plus récemment, un praticien de Lyon, M. Martin, a proposé un titre de méthode couvant cette résection pratiquée par une ouverture préalable frayée au moyen de la trépanation de l'alvéole, il rapporte des observations favorables.‖

Le plus ordinairement, une telle pratique demeure impossible à moins de pratiquer, ainsi que le voudrait M. Martin, de véritables délabrements auprès desquels l'extraction est une opération bénigne. Une nécessité s'impose alors : l'ablation préalable et temporaire de la totalité de l'organe permettant d'effectuer en dehors de l'économie la résection de la partie altérée. C'est à ce moment qu'intervient la greffe en ce qu'elle conduit à la restitution de la partie restée saine dans son lieu primitif.

Le manuel opératoire contient trois temps :

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* Communication personnelle. † Communication personnelle.

‡ *Comptes rendus et Mem. de la Société d'Otologie*, 1878, 9 Novembre. *Bulletin l'Académie de Médicine*, 19 Novembre, 1878. *Compte rendu des Séances de l'Académie des Sciences*, 6 Janvier, 1879.

§ Clinique de l'Hôpital St. Louis, communication orale.

‖ *Lyon Médical*, tom xxxvii. 1881, p. 35.

1° Ablation totale de la dent chez laquelle le diagnostic d'une périostite chronique du sommet a été établi et qui présente un état physique susceptible de conservation ou de restauration ;

2° Résection chirurgicale de la partie altérée ;

3° Réimplantation immédiate.

Incidemment, entre le deuxième et le troisième temps, le chirurgien pourra pratiquer, avant la greffe, diverses autres opérations : lavage du foyer purulent, ablation des séquestres, et sur la dent même en dehors de la bouche, résection de certaines fractions malades de la couronne obturatoire dans le cas de carie, etc.

L'extraction de la dent, qui comprend le premier temps, doit être pratiquée avec des précautions particulières. Il faut en effet éviter toute lésion aussi bien de la gencive que de la dent elle-même. L'emploi du clavier devra être exclusivement adopté.

L'opération se fera lentement, progressivement et sans mouvements de latéralité, qui risqueraient de compromettre l'intégrité du bord alvéolaire. Il faut dire, du reste, que l'opération est ordinairement facilitée par l'existence même de la périostite qui a gonflé notablement le périoste et congestionné les parties voisines. Cependant, dans quelques cas de fistule ancienne, il arrive, au contraire, que les adhérences avec le périoste resté sain sont d'autant plus serrées et solides, que les produits inflammatoires ont une issue facile par la fistule, et ne tendent plus à se propager sur les autres points.

Aussitôt l'extraction effectuée, et pendant que le malade prend quelques minutes de repos, on procède à l'examen pour apprécier la nature et l'étendue de la lésion radiculaire, puis, au moyen de la pince de Liston, on pratique la section de toute l'étendue de la partie dénudée et rugueuse. On adoucit alors avec une lime neuve ou très soigneusement lavée les angles de section, afin de ne laisser aucune arête tranchante ou piquante, et on place, aussitôt après, la dent dans un linge mouillé d'eau tiède. On fait alors l'examen de la couronne.

Si la dent est dépourvue de toute autre lésion que celle du sommet déjà reséqué, on la réimplante aussitôt que l'hémorrhagie alvéolaire est arrêtée. Si elle est frappée de carie, on devra, le plus rapidement possible, pratiquer les opérations nécéssaires, c'est-à-dire, la préparation de la cavité, et appliquer avec l'or ou toute autre substance une obturation qui donnera parfois des résultats désirables dans la bouche. Ces indications particulières ne sont toutefois pas constantes, car la périostite du sommet n'est pas nécessairement liée à une carie antérieure. Un bon nombre de dents réséquées et greffées étaient dépourvues de toute altération de la couronne, la lésion radiculaire ayant sa pathogénie individuelle, en dehors de toute autre intervention morbide.

Le troisième temps, qui comprend la greffe proprement dite, ne présente pas ordinairement de difficultés sérieuses. Pour les dents uni-radiculaires, la réimplantation est toujours sûre. Elle est plus laborieuse parfois pour les molaires, dont les racines peuvent être divergentes, et la remise en place s'accompagne d'un petit bruit sec qui indique qu'elle a repris sa position première. Cette manœuvre ne cause que peu ou pas de douleur. Dans quelques cas, cependant, elle a été accompagnée d'une douleur très-aiguë, mais sans durée.

Les soins consécutifs consistent dans l'application, quelquefois nécessaire, de moyens contentifs : bandage en huit de chiffre rosière en gutta-percha, &c. Ces procédés sont surtout indiqués pour les dents uni-radiculaires lorsqu'une résection assez étendue les a privées d'une grande partie de leur surface d'affleurement. Il n'en est pas de même pour les molaires, que la perte d'une racine réséquée n'empêche pas de conserver, par les autres restées saines, une surface de greffe suffisante.

Les moyens contentifs ne sont d'ailleurs nécessaires, que pendant un ou deux jours au plus, la réunion, lorsqu'elle s'effectue, étant très-prompte. Ensuite, nous avons

l'habitude d'appliquer en permanence dans le vestibule des compresses d'ouate imbibées d'une solution salinée de chlorate de potasse, fréquemment renouvelées pendant toute la durée des phénomènes de réaction.

S'il existe une fistule, ce qui est le cas le plus fréquent, on devra en maintenir drainage soit par un tube de drainage, soit par un cathétérisme fréquemment répété. Le maintien d'une fistule pendant les premiers soins qui suivent la greffe est même une condition essentiellement favorable au succès, en ce sens qu'elle favorise l'élimination des produits ivers dont le foyer est le réceptacle : débris de périoste mortifié, productions fongueuses fragments osseux détachés, &c.

L'utilité bien démontrée d'une fistule nous a même engagé lorsqu'il n'en existe pas de naturelle, à perforer directement la paroi alvéolaire pour pénétrer dans le foyer et y maintenir pendant quelques jours un séton.

Le drainage est particulièrement indiqué lorsqu'il existe des fistules multiples, comme par exemple un trajet traversant de part en part le maxillaire supérieur et réunissant deux orifices, l'un situé dans le vestibule, l'autre à la voute palatine. Un mode e drainage spécial qui nous a donné les meilleurs résultats, est l'installation au travers de l'os d'un fil métallique en or ou en platine, conduit au moyen d'une aiguille de Deschamps détrempée, afin de suivre sans se briser les contours les plus sinueux. Cette application maintenue pendant plusieurs semaines, nous a permis, dans quelques cas, d'assurer non-seulement le maintien de la greffe et sa consolidation régulière, mais encore l'élimination complète de tous les produits inflammatoires accumulés dans un trajet osseux.

Les suites de l'opération sont le plus souvent fort simples. Si la consolidation s'effectue, les adhérences nouvelles sont établies dès les premières heures ; la réaction locale est légère surtout s'il existe par une fistule, drainée ou non, un écoulement libre du pus à l'extérieur. Peu ou pas de phénomènes généraux. Les fistules se tarissent et se ferment, le foyer s'oblitère, sans doute par des productions cicatricielles à la fois fibreuses et osseuses,* et la consolidation complète, ainsi que la guérison de tous les accidents, survient après un temps moyen de 10 à 12 jours. Cette période, toutefois se prolonge d'avantage dans les cas de fistules doubles ou triples nécessitant un drainage prolongé, en raison de la présence de clapiers multiples et de fragments nécrosés dont l'élimination est nécessairement lente.

Le mécanisme de la consolidation consiste d'abord dans le rétablissement des adhérences vasculaires entre l'anneau du périoste resté sain autour du tronçon de la racine et la muqueuse gencivale. Ces premières connexions sont bientôt suivies du retour des liens vasculaires avec la paroi osseuse alvéolaire elle-même. Elles sont amplement suffisantes ponr rétablir, au sein des tissus de la dent greffée, le mouvement nutritif interrompu.

On sait, en effet, par les travaux les plus récents des anatomistes, que la couche du tissu appelé "cément" qui revêt l'extérieur de la racine, est reliée par les ramifications des ostéoplastes aux canalicules de l'ivoire, de sorte que ce dernier tissu peut continuer de vivre et de fonctionner par cette voie. Elle est désormais la seule d'ailleurs, car la pulpe centrale est toujours frappée de mort lorsqu'une périontite a envahi le sommet de la racine et détruit le faisceau vasculo-nerveux qui représente, on le sait, la source vitale la plus importante entre l'organe et l'économie.

Cette perte préalable, de la pulpe donne précisément la raison de la coloration grise

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* Nous n'avons pas vérifié exactement ce mécanisme, l'occasion nous ayant manqué ...u'à présent, c'est-à-dire pratiquer l'ablation d'une dent un certain temps après la con-ation de la greffe.

TABLEAU SYNOPTIQUE DE CENT OBSERVATIONS DE RÉSECTIONS ET GREFFES PAR RESTITUTION.

No. d'Ordre.	Nom, Age de l'Opéré.	Dent.	Avec ou sans Carie.	Accidents.	Fistule Muqueuse.	Fistule Cutanée.	Date de l'Opération.	Nature de la Lésion, et Etendue de la Résection.	Durée du Traitement.	Complications.	Résultat.	Revu après.	Observations.
1	M. le Dr. C. B. 30 ans	Incis. lat. sup. droite	Sans carie	Abcès nombreux	Double: vestibulaire et palatine	...	28 mai 1875	Le sommet est dénudé, un peu résorbé; résection de 4 millimètres	14 jours	Drainage transversal avec un fil de platine passant par les 2 fistules	Guérison	6 mois	
2	Mlle. N. 23 ans	Incis. lat. inf. droite	Do.	3 abcès	Vestibulaires	...	23 août 1875	Dénudation; résection de 3 millimètres	10 do.	...	Do.	2 ans	
3	M. N. 32 ans	1er prémolaire sup. droite	Carie pénétrante ouverte	Abcès nombreux	Do.	...	5 nov. 1875	3 millimètres de dénudation et de résection au sommet externe	10 do.	Obturation de la carie hors de la bouche	Do.	2 do.	Avant l'opération existait un large décollement du maxillaire supérieur.
4	Mme. L. 40 ans	Canine sup. droite	Do.	Abcès gingivaux nombreux	Do.	...	10 dec. 1875	Résection de 2 millimètres au sommet dénudé et portant une petite fongosité périostique	30 do.	Do.	Do.	2 do.	
5	Mlle. De L. 17 ans	1er mol. inf. droite	Carie pénétrante obturée	Do.	Do.	...	10 dec. 1875	Résection de 3 millimètres au sommet postérieur dénudé et portant des fongosités	10 do.	Réobturation hors de la bouche	Do.	3 do.	L'opération fut suivie d'accidents généraux: fièvre, &c., et de l'apparition d'un nouvel abcès gingival qui se reproduisit deux fois pour se fermer entièrement un mois plus tard.
6	M. R. 23 ans	1er prémolaire sup. gauche	Carie pénétrante avec suintement	Abcès vestibulaires nombreux	Do.	...	20 dec. 1875	Résection de 3 millimètres à chaque sommet; l'interne est dénudé, hypertrophié, et l'externe porte un kyste périostique	9 do.	Obturation hors de la bouche	Do.	2 do.	Un drainage de la carie maintenu pendant 3 ans était devenu insuffisant. Il fallut enlever l'obturation; série de petits abcès gingivaux consécutifs à l'opération.
7	M. V. 48 ans	Canine inf. droite	Sans carie	1 abcès	...	Sous mentonnière	18 fev. 1876	Résection de 2 millimètres au sommet dénudé	15 do.	...	Do.	8 mois	La fistule s'est plusieurs fois fermée et réouverte pendant les trois premiers mois qui suivirent l'opération. Elle a fini cependant par se fermer définitivement.

TABLEAU SYNOPTIQUE DE CENT OBSERVATIONS DE RÉSECTIONS DE GREFFES PAR RESTITUTION.—(*Suite.*)

No. d'Ordre.	Nom, Age de l'Opéré.	Dent.	Avec ou sans Carie.	Accidents.	Fistule Muqueuse.	Fistule Cutanée.	Date de l'Opération.	Nature de la Lésion, et Etendue de la Résection.	Durée du Traitement.	Complications.	Résultat.	Revu après	Observations.
8	M. X. 19 ans	Incis. méd. inf. droite	Sans carie	Abcès revenant à peu près périodiquement, 1 fois par an, pendant 8 ans	...	A la fossette du menton	4 mars 1876	Résection de 2 millimètres au sommet dénudé	17 jours	Un léger allongement de la dent persista après la consolidation ; on fit des cautérisations à l'acide chromique, au cautère actuel; on finit par la résection à la lime	Insuccès	...	La tentative, qui avait d'abord paru devoir se terminer par la guérison, a abouti à l'élimination au bout de 2 mois.
9	Dr. M. 40 ans	Incis. lat. sup. gauche	Carie pénétrante avec suintement purulent	...	...	...	14 avril 1876	Résection de 3 millimètres du sommet dénudé; la face latérale droite est aussi dénudé dans toute sa hauteur	...	Obturation hors de la bouche	Elimination le 6e jour	...	L'insuccès est dû à ce qu'il restait insuffisamment de périoste pour la consolidation. La racine était dénudée au sommet dans une étendue de ½ centimètre la face antèro latérale droite, entièrement dénudée ; le périoste restant était lui-même épaissi, granuleux, rouge.
10	M. D. 29 ans	1er prémolaire sup. gauche	Carie pénétrante	Abcès vestibulaires multiples	Vestibulaire	...	24 avril 1876	Résection et dénudation de 2 millimètres à chaque sommet	8 jours	Obturation	Guérison	13 mois	Plusieurs petits abcès gingivaux après l'opération.
11	Mme. L. 35 ans	Incis. méd. sup. gauche	Sans carie	Do.	Vestibulaire, communiquant chacune avec un vaste clapier central	...	26 avril 1876	Dénudation de 3 millimètres ; résection de 4 millimètres	2 mois	...	Do.	5 do.	Les deux foyers de périostite communiquaient ensemble et avec un vaste clapier situé dans le maxillaire supérieur. Le clapier fut ouvert sur la voûte palatine, et un fil métallique fut appliqué traversant la totalité du bord alvéolaire. Après 2 mois, la guérison fut obtenue.
12	Do.	Incis. lat. sup. droite	Do.	Do.	Do.	...	1er mai 1876	Dénudation de 3 millimètres ; résection de 4½ millimètres	Do.	...	Do.	Do.	Do.

TABLEAU SYNOPTIQUE DE CENT OBSERVATIONS DE RÉSECTIONS DE GREFFES PAR RESTITUTION.—(*Suite.*)

No d'Ordre.	Nom, Age de l'Opéré.	Dent.	Avec ou sans Carie.	Accidents.	Fistule Muqueuse.	Fistule Cutanée.	Date de l'Opération.	Nature de la Lésion, et Etendue de la Résection.	Durée du Traitement.	Complications.	Résultat.	Revu après	Observations.
13	Mme. J. 50 ans	1er prémolaire inf. gauche	Carie pénétrante	Serie d'abcès de périostite sans abcès ni fistule, mais accompagnés de douleurs très vives	...	...	4 mai 1876	Sommet dénudé, résorbé; fongosités périostiques; résection de 3 millimètres	19 jours	Obturation hors de la bouche	Guérison	2½ ans	Un léger allongement persista pendant plusieurs mois, sans amener de douleurs, et finit par disparaître.
14	Mme. X. 30 ans	Dent de sagesse inf. gauche	Carie pénétrante obturée avec drainage	Suintement par le drainage, accès de périostite sans abcès, douleurs vives malgré le drainage	...	...	26 mai 1876	Sommet dénudé, résorbé; fongosités périostiques; résection de 4 millimètres	20 do.	Obturation du drainage hors de la bouche	Do.	19 mois	La dent conserva, pendant près de 3 mois, une grande mobilité qui finit par disparaître.
15	Mme. B 45 ans	Incis. lat. sup. droite	Sans carie	Vaste clapier osseux	Fistule vestibulaire	...	2 juin 1876	Dénudation de 3 millimètres; résection de 3½ millimètres	6 mois	...	Do.	14 do.	Traitement long. Il a fallu ouvrir le clapier osseux par la voûte palatine, maintenir un drainage de l'ouverture de la fistule vestibulaire pendant 2 mois puis dilater l'orifice antérieur pour l'extraction d'un sequestre.
16	M. V. 24 ans	1er molaire sup. droite	Carie pénétrante	1 abcès palatin	Fistule palatine	...	19 juin 1876	Sommet antéro-externe sain; sommet postéro-externe dénudé, et réséqué de 1 millimètre; sommet interne dénudé et réséqué de 3 millimètres	5 jours	Obturation hors de la bouche	Do.	Pas revu	
17	M. L. 28 ans	Incis. méd. sup. droite	2 trépanations	1 abcès vestibulaire	Fistule vestibulaire		29 juin 1876	Dénudation et résection de 4 millimètres	36 do.	Obturation, hors de la bouche, des deux ouvertures	Do.	1 an	Périostite spontanée, abcès. Pour éviter la fistule, on fit une double trépanation qui laissa écouler un suintement fétide. Fluxion, abcès, après l'opération.

TABLEAU SYNOPTIQUE DE CENT OBSERVATIONS DE RÉSECTIONS DE GREFFES PAR RESTITUTION.—(*Suite.*)

No.	Nom, Age de l'Opéré.	Dent.	Avec ou sans Carie.	Accidents.	Fistule Muqueuse.	Fistule Cutanée.	Date de l'Opération.	Nature de la Lésion, et Etendue de la Résection.	Durée du Traitement.	Complications.	Résultat.	Revu après	Observations.
18	M. A. 20 ans	1er prémolaire sup. droite	Carie pénétrante	Nombreux abcès vestibulaires	...	...	19 juillet 1876	Deux sommets dénudés et réséqués de 3 millimètres	9 jours	...	Guérison	11 mois	
19	M. F. 35 ans	2e prémolaire sup. gauche	Do.	Plusieurs abcès palatins	...	...	19 juillet 1876	Sommet interne dénudé et réséqué de 3 millimètres; sommet externe portant un kyste périostique; résection de 4 millimètres	...	...	Insuccès	...	Le 1er août, M. F. souffrant beaucoup, et ne voyant pas la consolidation s'effectuer, enleva la dent, non sans quelques difficultés. L'insuccès paraît dû à ce qu'il n'y avait pas de communication entre l'alvéole et l'extérieur.
20	Mlle. J. 17 ans	1er molaire sup. droite	Do.	Série d'abcès de périostite aiguë avec suintement, puis résolution sans abcès ni fistule laissant un gonflement de l'os.	...	...	18 déc. 1876	Les deux racines externes portent un kyste périostique; résection de 4 millimètres; racine interne saine	15 do.	...	Guérison	2 ans	
21	Mme. B. 35 ans	Incis. lat. sup. droite	Do.	Fluxions et abcès vestibulaires nombreux	Fistule vestibulaire	...	11 jan. 1877	Dénudation et résection de 1 millimètre	10 do.	Obturation hors de la bouche	Do.	6 mois	
22	M. K. 15 ans	Incis. méd. inf. gauche	Sans carie	1 abcès	...	A la fossette du menton	18 jan. 1877	Dénudation et résection de 2 millimètres	3 mois	...	Do.	6 do.	Périostite spontanée; pendant 2 ans l'orifice externe de la fistule s'était recouvert périodiquement tous les mois d'une croûte d'apparence cornée. Consolidation lente (après 23 jours). Drainage de la fistule pendant 3 mois.
23	M. R. 28 ans	2e molaire inf. gauche	Carie pénétrante obturée avec drainage	Abcès vestibulaires périodiques	...	...	27 jan. 1877	Sommet postérieur: dénudation et résection de 2 millimètres. Sommet antérieur: dénudation et résection de 1 millimètre	...	Obturation du trou de drainage	Insuccès	...	Le drainage n'avait pas réussi et avait laissé revenir les mêmes abcès périodiques qu'avant. Consolidation imparfaite, allongement considérable de la dent qui empêche l'occlusion de la bouche. Extraction le 2 juin.

TABLEAU SYNOPTIQUE DE CENT OBSERVATIONS DE RÉSECTIONS DE GREFFES PAR RESTITUTION.—(*Suite.*)

No. d'Ordre.	Nom, Age de l'Opéré.	Dent.	Avec ou sans Carie.	Accidents.	Fistule Muqueuse.	Fistule Cutanée.	Date de l'Opération.	Nature de la Lésion, et Etendue de la Résection.	Durée du Traitement.	Complications.	Résultat.	Revu après	Observations.
24	M. S. 20 ans	2e molaire inf. droite	Carie pénétrante	Plusieurs accès de périostite aiguë, avec suintement purulent par le canal dentaire, gonflement de l'os	...	...	31 jan. 1877	Dénudation et résection de 1 millimètre aux deux sommets; fongosités périostiques entre les deux racines	16 jours	Obturation	Guérison	7 mois	
25	M. le Dr. E. 33 ans	Incis. med. sup. gauche	Sans carie	Plusieurs abcès vestibulaires et fluxions	Fistule vestibulaire	...	26 avril 1877	Dénudation et résection de 2 millimètres	14 do.	...	Do.	1½ ans	Drainage de la fistule. Persistence d'un léger allongement, résection à la lime de 1er millimètre environ du bord libre de la couronne.
26	Mme. R. 35 ans	Canine sup. gauche	Carie pénétrante	Abcès et fistules vestibulaires	...	...		Do.	6 do.	Obturation à l'oxychlorure de zinc	Do.	18 mois	
27	M. C. 30 ans	2er prémolaire sup. gauche	Do.	Plusieurs abcès de périostite aiguë; amenant de vives douleurs, mais sans abcès, sans fluxions, pas de fistule	...	...	11 mai 1877 4 juin 1877	Kyste périostique, résection de 3 millimètres	10 do.	Obturation	Do.	6 do.	3 jours après l'opération, fluxion de la joue accompagnée d'éruption milaire sur le côté correspondant du visage et de phénomènes généraux, terminée par résolution.
28	Mlle. Ch. 20 ans	2e prémolaire sup. droite	Do.	2 abcès vestibulaires	Fistule vestibulaire	...	5 juin 1877	Kyste périostique résection de 5 millimètres	9 do.	Do.	Do.	1½ ans	Drainage de la fistule.
29	M. T., etudiant, 27 ans	Incis. lat. sup. gauche	Sans carie	Plusieurs fluxions: 1 abcès vestibulaire	Do.	...	26 juin 1877	Dénudation et résection de 2 millimètres	35 do.	...	Do.	6 mois	La dent avait été fortement limée sur ses deux côtés. Drainage de la fistule qui a mis longtemps à se fermer à cause d'un petit foyer d'osteite.

TABLEAU SYNOPTIQUE DE CENT OBSERVATIONS DE RÉSECTIONS DE GREFFES PAR RESTITUTION.—(*Suite.*)

No. d'Ordre.	Nom, Age de l'Opéré.	Dent.	Avec ou sans Carie.	Accidents.	Fistule Muqueuse.	Fistule Cutanée.	Date de l'Opération.	Nature de la Lésion, et Etendue de la Résection.	Durée du Traitement.	Complications.	Résultat.	Revu après	Observations.
30	M. D. 32 ans	1er prémolaire sup. gauche	Carie pénétrante	1 abcès palatin	Fistule palatine	...	3 juillet 1877	Dénudation et résection de toute la racine interne—6 millimètres	30 jours	Obturation	Guérison	6 mois	Drainage de la fistule.
31	M. V. 55 ans	Incis. lat. sup. droite	Do.	3 fluxions dont 2 abcédées	Fistule vestibulaire	...	24 juillet 1877	Dénudation et fongosités périostiques, résection de 4 millimètres	11 do.	Obturation	Do.	8 do.	La dent, ayant une grande tendance a descendre, est maintenue avec un appareil fait avec de l ouate et du collodion. Drainage de la fistule.
32	M le Dr. X. 38 ans	Do.	Sans carie	Plusieurs fluxions; la dernière abcédée sur la gencive	Do.	...	1er août 1877	Dénudation et résection de ½ centimètre	...	...	Do.	5 do.	Nécrose de la paroi alvéolaire.
33	M. C. 45 ans	2e gros. mol. inf. droite	Carie pénétrante	1 fluxion, suintement par la carie	...	...	9 août 1887	Dénudation et résorption, résection de 4 millimètres	14 do.	Obturation	Do.	Perdu du vue	A la suite de la fluxion très intense survint probablement un peu d'osteite péri-alvéolaire qui comprima le nerf dentaire inférieur, car il s'en suivit une hemianesthèsie des parties où aboutit ce nerf.
34	M. P. 32 ans	Incis. lat. sup. droite	Carie pénétrante obturée	Kyste périostique saillant à la voûte palatine	...	...	24 août 1877	Dénudation et résection de 5 millimètres	...	Ouverture du kyste et drainage par la voûte palatine	Do.	16 mois	Hémorrhagie à l'ouverture du kyste, hémorrhagie secondaire le lendemain. Le retrait du kyste demanda plus d'une année de traitement, mais la dent conserva sa solidité definitive.
35	Mme. L. 35 ans	Incis.cent. sup. gauche	Sans carie	1 abcès vestibulaire	Fistule vestibulaire	...	29 août 1877	Dénudation et fongosités périostiques; résection de 4 millimètres	1 mois	Fongosités du bord gingival touchées par l'acide chromique	Do.	1 an	
36	Mlle. de L. 18 ans	1er gros. mol. sup. gauche	Carie pénétrante	Congestions permanentes sans abcès	...	...	6 oct. 1877	Les racines antéro-externe et interne dénudés, l'interne réséquée entièrement, l'antéro-externe de 2 millimètres	15 jours	Obturation d'un drainage antérieur accidentellement obstruée au moment du début des accidents	Do.	14 mois	Cette malade, déjà opérée pour une autre dent (Obser. 5), a subi ainsi deux opérations avec un succés egal.

TABLEAU SYNOPTIQUE DE CENT OBSERVATIONS DE RÉSECTIONS DE GREFFES PAR RESTITUTION.—(*Suite.*)

No. d'Ordre.	Nom, Age de l'Opéré.	Dent.	Avec ou sans Carie.	Accidents.	Fistule Muqueuse.	Fistule Cutanée.	Date de l'Opération.	Nature de la Lésion, et Etendue de la Résection.	Durée du Traitement.	Complications.	Résultat.	Revu après.	Observations.
37	M. N. 25 ans	1er prémolaire sup. droite	Carie pénétrante obturée	Nombreuses fluxions abcédées	...	...	24 dec. 1877	Dénudation des deux racines dans une étendue de 3 millimètres qui sont réséqués	6 jours	...	Guérison	6 mois	
38	M. U. 28 ans	1er prémolaire sup. gauche	Do.	Plusieurs fluxions et abcès	Fistule vestibulaire	...	24 dec. 1877	Deux sommets dénudés; résection de 3 millimètres	15 do.	...	Do.	Pas revu	La dernière fluxion, suivie d'abcès, avait laissé une dénudation de 15 millimètres de diamètre sur le maxillaire, autour de la fistule.
39	Mlle. de S. 19 ans	1er gros. mol. inf. gauche	Do.	Plusieurs fluxions	Fistule gingivale	...	25 jan. 1878	Dénudation et résection de 1½ millimètres	12 do.	...	Do.	11 mois	
40	M. R. 29 ans	Do.	Carie pénétrante	Abcès gingival	Do.	...	30 jan. 1878	Dénudation des deux sommets, résection de 3 millimètres	15 do.	Obturation de la carie hors de la bouche	Do.	7 do.	
41	M. le Dr. C. 27 ans	Incis. lat. sup. droite	Do.	Fluxions et abcès de la gencive	Do.	...	28 fev. 1878	Dénudation et résection de 2 millimètres	2 do.	Obturation à l'oxychlorure de zinc	Do.	10 do.	Le malade quitté Paris sans accident, le 3e jour de l'opération, mais il a donné, 10 mois après, de ses nouvelles.
42	M. B. 27 ans	1er gros. mol. inf. droite	Carie pénétrante ouverte	Fluxion abcédée	Do.	...	14 mars 1878	Résection oblique de ½ centimètre de la racine antérieure	13 do.	Obturation métallique	Do.	9 do.	
43	M. K. 40 ans	Incis. lat. sup. gauche	Sans carie	2 abcès	Fistule double: palatine et vestibulaire	...	22 fev. 1878	Résection oblique de 3 millimètres du sommet	14 do.	...	Do.	6 do.	Drainage de la fistule, extraction de plusieurs séquestres après dilatation d'un des orifices.
44.	M. S. 22 ans	1er molaire inf. gauche	Carie pénétrante avec suintement purulent	Abcès du bord gingival	Fistule vestibulaire	...	27 mars 1878	Résection de 3 millimètres de la racine antérieure	6 do.	Obturation sans drainage en dehors de la bouche	Do.	5 do.	

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No. d'Ordre.	Nom, Age de l'Opéré.	Dent.	Avec ou sans Carie.	Accidents.	Fistule Muqueuse.	Fistule Cutanée.	Date de l'Opération.	Nature de la Lésion, et Etendue de la Résection.	Durée du Traitement.	Complications.	Résultat.	Revu après	Observations
45	M. de N. 23 ans	Incis. cent. inf. droite	Sans carie	Abcès cutané	...	Fistule de la fossette mentonnière	9 avril 1878	Résection de 2 millimètres	15 jours	...	Guérison	9 mois	
46	M. B. 43 ans	1er molaire inf. droite	Carie pénétrante avec suintement purulent	Abcès gingival	Fistule du vestibule	...	15 avril 1878	Résection des deux sommets dans une étendue de 3 à 4 millimètres	5 do.	Obturation complète sans drainage en dehors de la bouche	Do.	8 do.	Les accidents avaient eu pour point de départ la suppression du drainage de la carie pénétrante.
47	M. L. 21 ans	2e gros. mol. inf. droite	Carie pénétrante ouverte	Abcès de la face	...	Fistule cutanée	23 avril 1878	Résection des deux sommets dans une étendue de 2 à 4 millimètres	22 do.	Obturation simple hors de la bouche	Do.	4 do.	
48	M. C. 23 ans	Incis. lat. sup. droite	Sans carie	Double abcès du vestibule et de la voûte palatine	Fistule traversant d'avant en arrière le bord alvéolaire	...	28 avril 1878	Résection de 4 millimètres	10 do.	...	Elimination le 10e jour	...	L'insuccès est manifestement dû à l'insuffisance de l'évacuation du foyer et à la presence de quelques séquestres.
49	M. E. 40 ans	1er prémolaire inf. gauche	Carie pénétrante obtururée sans traitement	Abcès multiples du bord alvéolaire	...	...	6 mars 1878	Résection de 3 millimètres	9 do.	...	Guérison	8 mois	
50	Mme. B. 40 ans	Incis. cent. inf. droite	Sans carie	Suppuration alvéolaire permanente	...	...	15 avril 1878	Résection oblique de 4 millimètres	8 do.	...	Do.	8 do.	Cette observation a cela de particulier, que la forme de lésion de la racine se rapproche d'avantage de l'ostéo-périostite que de la périostite proprement dite.
51	Mlle. L. 20 ans	1er gros. mol. sup. droite	Carie pénétrante obturée depuis 4 ans	8 à 10 fluxions dont 3 abcédées	Vestibulaire depuis le dernier abcès	...	20 mai 1878	Simple dénudation de 2 millimètres aux 2 sommets; résection de 3 millimètres à chaque sommet	12 do.	...	Do.	13 do.	Do.

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No. d'Ordre.	Nom, Age de l'Opéré.	Dent.	Avec ou sans Carie.	Accidents.	Fistule Muqueuse.	Fistule Cutanée.	Date de l'Opération.	Nature de la Lésion, et Etendue de la Résection.	Durée du Traitement.	Complications.	Résultat.	Revu après	Observations.
52	M. R. 26 ans étudiant en droit	2e gros. mol. sup. droite	Carie pénétrante non obturée	Fluxions multiples abcédées	...	...	26 mai 1878	...	...	Obturation hors de la bouche	Guérison	1 an	
53	M. D. 27 ans	2e gros. mol. sup. gauche	Carie pénétrante depuis 7 ans	Depuis 10 mois, 5 ou 6 fluxions, 3 abcès avec nécrose partielle	Vestibulaire	...	3 juin 1878	2 racines externes dénudées et résorbées; résection de 4 millimètres; vaste clapier osseux	9 jours	Ablation d'un séquestre	Do.	4 mois	Après 9 jours, la dent est consolidée; le clapier osseux est en voie de réparation; la fistule persiste.
54	M. A. 22 ans	1er prémolaire sup. gauche	Carie pénétrante obturée, drainée sans résultat	...	...	...	2 juillet 1878	Tumeurs fibreuse au sommet; résection de 4 millimètres	3 do.	Obturation du drainage	Do.	1 an	La consolidation est complète après 3 jours sans suppuration.
55	M. T. 22 ans	1er gros. mol. sup. droite	Carie pénétrante	Plusieurs fluxions 3 abcès dénudation osseuse	Vestibulaire depuis 6 mois	...	15 juin 1878	Dénudation et résorption de la racine postéro-externe; dénudation de l'antéro-externe; résection de 3 à 4 millimètres à chacune; résection entière de l'interne	25 do.	Obturation en dehors de la bouche; la réimplantation offrant des difficultés on a dû couper entièrement la racine interne	Do.	1 an	Consolidation lente, cependant parfaite au bout d'un mois, malgré la mutilation de l'organe; guérison complète de la fistule.
56	M. M. 34 ans	1er gros. mol. inf. droite	Carie pénétrante	Vaste clapier osseux	Vestibulaire depuis 5 mois	...	5 juillet 1878	Dénudation et déstruction du sommet; résection de 4 millimètres	12 do.	Obturation en dehors de la bouche	Do.	6 mois	
57	Mme. de A. 42 ans	1er gros. mol. inf. droite	Sans carie	Do.	Vestibulaire depuis 2 mois	...	10 juillet 1878	Tumeurs fongueuses périostales au sommet; périoste partout ailleurs hypertrophié et fongueux sur certains points; résection de 3 millimètres; section des fongosités	20 do.	...	Do.	Pas revu	

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No. d'Ordre.	Nom, Age de l'Opéré.	Dent.	Avec ou sans Carie.	Accidents.	Fistule Muqueuse.	Fistule Cutanée.	ate de l'Opération.	Nature de la Lésion, et Etendue de la Résection.	Durée du Traitement.	Complications.	Résultat.	Revu après	Observations.
58	M. R. 30 ans	Canine inf. droite	Carie post. très petite, obturée depuis 3 ans	Abcès il y a 5 mois	...	Fistule de la fossette mentonnière	19 août 1878	Racine très volumineuse; dénudation de ⅓ de la hauteur; résorption du cément; résection de 2 millimètres	60 jours	Persistance de la suppuration par l'extrême étendue de la fistule	Guérison	...	Cette guérison était complète depuis un an au point de vue de la greffe; mais la persistance de la fistule avec un écoulement du reste très faible, décida le malade à l'extraction de la dent.
59	M. D. 41 ans	Canine sup. droite	Sans carie, chûte de cheval pendant la guerre	Abcès tous les mois depuis 2 ans, sensation douloureuse sourde; pas d'ebranlement	Fistule longue et fléxueuse	...	22 oct. 1878	Dénudation simple en avant du sommet; résection de 2 millimètres obliquement	20 do.	...	Do.	15 mois	
60	M. S. 16 ans	Incis. lat. sup. gauche	Caries pénétrantes sur les 2 faces latérales	2 abcès précédés de fluxions considérables	Fistule permanente transversale au niveau du sommet.	...	22 oct. 1878	Dénudation simple; résection de 4 millimètres	12 do.	...	Do.	pas revu	
61	M. F. 45 ans	1er prémolaire sup. droite	Carie pénétrante obturée	Fluxions rares	Fistule gingivale depuis 10 ans avec fongosités	...	7 nov. 1878	Altération des 2 sommets; résection de la moitié de chacune des racines; sorties 4 millimètres	...	...	Insuccès	...	Au 4e jour de la greffe, le malade impatient enlève sa dent qui déjà offre une certaine résistance.
62	M. B. 24 ans	Incis. lat. sup.	Carie ancienne depuis 10 ans résequée au moyen de la lime, périostite consécutive	Fluxions et abcès multiples, clapiers décollements	Vestibulaire	...	26 nov. 1878	Altération du sommet; résection de 2 millimètres	30 do.	Extraction d'un séquestre assez volumineux sous le décollement	Guérison	Pas revu	

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63	M. K. 25 ans	1er prémolaire sup. droite	Carie pénétrante obturée antérieurement	Abcès continuels depuis 2 ans	Gingivale oblique de 3 centimètres de profondeur	...	24 jan. 1879	Dénudation de 2½ millimètres ; résection de 3 millimètres	...	...	Guérison	2 mois	
64	M. Y. 28 ans	2e mol. inf. gauche	Carie pénétrante obturée	3 fluxions considérables	Pas de fistules	...	20 fev. 1879	Résection de 4 millimètres à la racine postérieure ; résection de 1 millimètre à la racine antérieure	15 jours	...	Do.	5 do.	Le malade, revu fin juillet, 1879, dit que depuis 3 semaines seulement il peut se servir de cette dent, pour manger, comme des autres. Jusqu'à cette époque douleur à la pression.
65	Mlle. S. 17 ans	1er prémolaire sup. gauche	Deux caries dont une pénétrante	Plusieurs fluxions violentes, vastes clapiers	Plusieurs fistules gingivales	...	3 mars 1879	Résection de 5 millimètres dénudés et fongueux	13 do.	Une fluxion le lendemain	Do.	6 do.	Sondages réitérés du clapier et des fistules. 2 applications de pointes de feu amènent une consolidation rapide.
66	Mlle. A. 17 ans	Incis. méd. inférieure	Sans carie	Noyau induré permanent, remontant à 4 ans	...	...	19 mars 1879	Dénudation de 3 millimètres; fongosités ; résection des 3 millimètres affectés	18 do.	...	Do.	10 do.	Bandage en huit de chiffre maintenu 12 jours. Création d'une fistule artificielle avec séton.
67	M. L. 24 ans	1er mol. gauche	Carie pénétrante non obturée	...	...	Fistule à l'angle de la mâchoire	2 avril 1879	Résection de 2 millimètres à chacun des sommets	15 do.	Obturation hors de la bouche	Do.	3 do.	
68	Mlle. Q. 20 ans	1er mol. inf. droite	Carie pénétrante ancienne obturée.	Fluxion avec fistule pénétrante	Gingivale	...	28 avril 1879	2 sommets dénudés et présentant en outre une légère hypertrophie cémentaire	9 do.	...	Do.	1 an	
69	Mlle. P. 19 ans	1er gros. mol. sup.	Carie pénétrante antérieure	Vastes abcès, suppuration très abondante, clapier et dénudation osseuse	Gingivale	...	27 juin 1879	Fongosités périostiques aux 3 sommets ; résection de 3 millimètres aux racines externes et de 1 millimètre à la racine interne	20 do.	Extraction de plusieurs séquestres	Do.	5 mois	

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70	M. de X. 40 ans	1er mol. inf. gauche	Carie obturée depuis 10 ans	Fistule gingivale datant de 3 ans, abcès fréquents	Gingivale	...	18 juillet 1879	Petite tumeur embrassant les 2 racines; résection oblique des 1½ centimètres des 2 racines; légère portion d'alvéole entraînée dans l'extraction	20 jours	Un peu de fièvre; insomnie; fluxion légère	Guérison	...	
71	M. M. 35 ans	Incis. cent. sup. droite	Carie étrangère à l'affection	Pas de fistules	...	...	8 sept. 1879	Déviation par allongement et rotation de l'axe en dehors; résection en bec de flûte de 3 millimètres	...	Obturation en dehors de la bouche	Insuccès	...	L'insuccès est dû ici à la forme de la périostite qui rentrait dans la classe de l'ostéo-périostite.
72	Mme. R. 37 ans	Incis. cent. sup. droite	Do.	Séquestre éliminé, accidents reproduits 2 fois	2 fistules antérieures, 1 postérieure avec clapier.	...	13 sept. 1879	Obturations en dehors de la bouche; résection de 3 millimètres; bandage double de soie cirée	...	...	Do.	...	
73	M. de B. 74 ans	2e mol. inf. gauche	Carie pénétrante ancienne obturée	Ecoulement purulent abondant	3 fistules gingivales	...	22 sept. 1879	Dénudation de 2 millimètres; résection égale	15 do.	...	Guérison	Pas revu	La 2e prémolaire, affectée de la même lésion, avait été extraite il y a six mois, mais sans modification sur l'état du malade. Cessation immédiate de la suppuration.
74	M. S. 43 ans	2e mol. inf. gauche	Carie pénétrante obturée	Empâtement très étendu de la région cervico-maxillaire	...	...	27 sept. 1879	Fongosités des sommets; dénudation; résection de 4 millimètres	...	...	Do.	1 an	
75	M. B. 30 ans	1er mol. inf. gauch	Carie pénétrante obturée avec drainage depuis 18 mois	Abcès fistuleux de la gencive	Gingivale vestibulaire	...	20 oct. 1879	2 sommets altérés, l'antérieur est fongueux; résection de 2 millimètres	...	...	Do.	Pas revu	Une tentative antérieure de guérison a été faite et a consisté dans une simple extraction suivie de greffe au bout de 6 heures; mais sans résection. Les accidents se sont reproduits immédiatement dans la seconde opération.

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No. d'Ordre.	Nom, Age de l'Opéré.	Dent.	Avec ou sans Carié.	Accidents.	Fistule Muqueuse.	Fistule Cutanée.	Date de l'Opération.	Nature de la Lésion, et Etendue de la Résection.	Durée du Traitement.	Complications.	Résultat.	Revu après	Observations.
76	Mlle. T. 19 ans	Incis. lat. sup. gauche double greffe	Carie pénétrante obturée	Fistule cutanée au niveau de l'aile du nez persistant après une 1er greffe de cette dent, faite sans résection du sommet; 3 fluxions	Fistule gingivale au niveau du sommet de la racine	Fistule cutanée survenant 6 mois après l'aurification de la dent	30 oct. 1879	Résection de 5 millimètres environ	3 mois	Consolidation au bout de 10 jours; la fistule cutanée persiste; mais l'écoulement diminue; cautérisations à l'acide chromique; injections à l'acide thymique: un petit séquestre a retardé la guérison	Guérison	1 an	Un drainage est établi entre la fistule cutanée et le vestibule; par l'orifice buccal, on peut atteindre le séquestre. On le détache à l'aide d'un excavateur. Il est éliminé quelques jours après. A dater de ce moment l'écoulement devient insignifiant, et, à la fin de janvier, il avait complétement cessé.
77	M. B. 24 ans	2e mol. sup. droite	Vaste carie pénétrante occupant la moitié de la couronne obturée précédant	1er fluxion consécutive à une 1er obturation le 15 août; 2e fluxion après une 1er obturation avec drainage—ces 2 fluxions se sont terminées par abcès	Fistule palatine	...	5 nov. 1879	Altérations caractéristiques des 3 sommets; résection de ½ millimètre à la racine interne de ¼ aux 2 externes	10 jours	...	Do.	6 mois	La fistule de la racine palatine a été maintenue ouverte jusqu'à parfaite guérison.
78	M. M. 50 ans	Incis. sup. droite	Carie pénétrante avec suintement.	Intolerance de l'obturation et du drainage	Fistule gingivale intermittente	...	18 nov. 1879	Résection de 2 millimètres	21 do.	...	Do.	3 mois	
79	M. de P. 31 ans	1er mol. sup. droite	Carie ancienne obturée	Suppuration alvéolaire incessante, accidents généraux par ingurgitation du pus	...	...	30 nov. 1879	Résection complète de la racine antéro-externe et de 1 millimètre de la racine interne	20 do.	...	Do	1 mois	

TABLEAU SYNOPTIQUE DE CENT OBSERVATIONS DE RÉSECTIONS DE GREFFES PAR RESTITUTION.—(*Suite*)

No. d'Ordre.	Nom, Age de l'Opéré.	Dent.	Avec ou sans Carie.	Accidents	Fistule Muqueuse	Fistule Cutanée.	Date de l'Opération.	Nature de la Lésion, et Etendue de la Résection.	Durée du Traitement.	Complications.	Résultat.	Revu après	Observations.
80	M. C. 26 ans	2e mol. inf. gauche	Carie pénétrante ancienne	Périostite ancienne ayant résisté à tout traitement depuis 4 mois	Vestibulaire au niveau de la racine postérieure	...	19 dec. 1879	Périostite chronique des 2 sommets; résection de 3 millimètres de la racine postérieure et de 1½ millimètres de l'antérieure	18 jours.	Obturation hors de la bouche	Guérison	1 an	Le lendemain de l'opération la dent est complètement hors de l'alvéole, elle est remise en place. La malade la maintient avec les dents supérieurs pendant 18 heures. Le troisième jour la dent se consolide.
81	M. B. 36 ans	1er prémolaire sup. gauche	Carie pénétrante obturée depuis 15 ans.	Série d'abcès fistuleux	Gingivale	...	26 jan. 1880	Périostite chronique du sommet; résection de 2 millimètres	18 do.	...	Do.	3 mois	Nécrose du bord alvéolaire; ablation de divers séquestres; injections dans le clapier.
82	Mme. de N. Z. 32 ans	Incis. cent. sup. gauche	Carie lat. droite aurificé, carie lat. gauche aurificé.	Depuis, 6 mois, série d'abcès presque continuels	Vestibulaire	...	14 fev. 1880	Section oblique en arrière de 3 millimètres du sommet	25 do.	...	Do.	2 do.	
83	M. X. 27 ans	1er mol. sup. droite	Carie pénétrante obturée	Abcès et fistules depuis 3 mois.	Gingivale	...	27 fev. 1880	...	20 do.	...	Do.	Pas revu	
84	M. X. 35 ans	1er prémolaire inf. droite	Carie pénétrante obturée depuis longtemps	Abcès multiples fistules et clapier donnant sans cesse une quantité considérable de pus.	Do.	...	9 mars 1880	Résection de 3 millimètres du sommet dénudé et résorbé	30 do.	...	Do.	Do.	
85	M. B. 18 ans	1er mol. inf. gauche	Carie pénétrante obturée depuis 2 ans	Depuis l'oblitération poussées inflammatoires d'une grande violence, adénité sous-maxillaire	Do.	...	25 mars 1880	Résection en bec de flûte de 3 millimètres des 2 sommets	18 do.	Obturation en dehors de la bouche	Do.	Do.	

TABLEAU SYNOPTIQUE DE CENT OBSERVATIONS DE RÉSECTIONS DE GREFFES PAR RESTITUTION.—(*Suite.*)

No. d'Ordre.	Nom, Age de l'Opéré.	Dent.	Avec ou sans Carie.	Accidents.	Fistule Muqueuse.	Fistule Cutanée.	Date de l'Opération.	Nature de la Lésion, et Etendue de la Résection.	Durée de Traitement.	Complications.	Résultat.	Revu après	Observations.
86	Mlle. A. 13 ans.	Incis. lat. inf. gauche	Sans carie	Empâtement ancien du bord alvéolaire et du menton	...	...	7 juin 1880	Résection de 2 millimètres du sommet; drainage au fond du vestibule avec un fil de plomb	18 jours	...	Guérison	1 an	
87	M. B. 18 ans	Incis. lat. sup. droite	Carie antérieure aurificé	Kyste périostique du maxillaire supérieur du volume d'une grosse noix	Gingivale	...	7 juin 1880	Résection de 3 millimètres de la hauteur au niveau de la collerette de périoste qui correspond éxactement à l'insertion de la paroi kystique	2 mois	...	Do.	5 mois	Avant la greffe on établit un drain de fil de platine au travers du maxillaire, puis dilatation de l'orifice antérieure application du drain d'etain permanent.
88	M. de C.	2e prémolaire sup. gauche	Carie pénétrante obturée et drainée, continuation des abcès.	...	Vestibulaire	...	10 juin 1880	Résection de 3 millimètres; obturation en dehors de la bouche	10 jours	...	Do.	1 an	
89	Mme. X 25 ans.	Incis. cent. inf. gauche	Sans carie	Etat fluxionnaire permanent de la fosse canine.	...	...	14 juin 1880	Résection de 2 millimètres	21 do.	...	Do.	2 mois	Vaste clapier sous-jacent au sommet.
90	M. D. 24 ans	1er mol. inf. droite	Sans carie	Abcès multiples remontant à 4 mois	Gingivale	...	18 juin 1880	Résection de 1 centimètre environ à chaque sommet d'abord, puis de 1½ centimètres	18 do.	...	Do.	25 juin 1881	L'extraction a été laborieuse. La réimplantation de la dent offre des difficultés, les racines étant très longues, et présentant une certaine courbure d'avant en arrière. Il faut réséquer une partie notable des racines, pour qu'elles puissent rentrer dans l'alvéole.
91	M. R. 22 ans	Incis. cent. inf. droite	Sans carie	Etat fluxionnaire permanent de la région mentonnière.	Do.	...	21 juin 1880	Résection de 3 millimètres en bec de flûte	8 do.	...	Do.	Pas revu	
92	M. F. 25 ans	Incis lat. sup. gauche	Carie obturée depuis longtemps	Abcès à répétition depuis 3 ans	Do.	...	9 juillet 1880	Résection de 1½ millimètres	8 do.	...	Do.	5 mois	

TABLEAU SYNOPTIQUE DE CENT OBSERVATIONS DE RÉSECTIONS DE GREFFES PAR RESTITUTION—(*Su ite.*)

No. d'Ordre.	Nom, Age de l'Opéré.	Dent.	Avec ou sans Carie.	Accidents.	Fistule Muqueuse.	Fistule Cutanée.	Date de l'Opération.	Nature de la Lésion, et Etendue de la Résection.	Durée de Traitement.	Complications.	Résultat.	Revu après	Observations.
93	M. A. 25 ans	2e mol. inf. gauche	Carie ancienne obturée	Accidents inflammatoires répétés, depuis 3 mois.	...	...	3 juillet 1880	Résection de 2 millimètres aux deux racines	15 jours	...	Guérison	8 mois	
94	Mlle. V. 21 ans	Incis. lat. sup. gauche	Carie pénétrante	Fluxions répétés, douleurs intenses.	Vestibulaire	...	7 sept. 1880	Résection de 2 millimètres aux deux sommets	15 do.	Obturation métallique en dehors de la bouche	Do.	6 do.	
95	M. S. 18 ans	1er mol. inf. droite	Carie pénétrante obturée	Fluxion gingivale gonflement œdémateux du maxillaire	Gingivale	...	7 sept. 1880	Résection de 2 millimètres à chaque sommet	15 do.	...	Do.	6 do.	Obturation en dehors de la bouche.
96	Mme. de V. 30 ans.	Canine sup. droite	Do.	Fluxions multiples	Do:	...	15 sept. 1880	Résection de 2 millimètres	25 do.	...	Do.	Pas revu	
97	M. P. 25 ans	1er prémolaire sup. droite	Carie pénétrante libre.	Gonflement chronique de la région,	Permanente	...	21 jan. 1881	Do.	15 do.	...	Do.	Do.	
98	M. S. 18 ans	1er mol. sup. gauche	Carie pénétrante obturée depuis 2 ans	Abcès alvéolaires se reproduisant chaque jour et s'écoulant par un tube de drainage poussées inflammatoires	Vestibulaire	...	7 fev. 1881	Do.	15 do.	...	Do.	5 mois	L'opération a été suivie de quelques accidents généraux inquiétants puis, au bout de 4 jours, l'amélioration fut très rapide.
99	M. A. 11 ans	Incis. cent. sup. droite réduite à sa seule racine	Fracture accidentelle	Fluxions multiples, abcès Nombreux	Do.	...	9 fev. 1881	...	25 do.	...	Do.	5 do.	Application sur la racine d'une dent artificielle avec pivot tubulé formant drainage. La greffe a donc eu pour but ici de rétablir une racine de dent incisive pourvue d'un appareil de prothèse. C'est le seul cas de ce genre dans cette série.
100	M. de T. 24 ans	1er prémolaire sup. droite	Carie pénétrante	Nombreux abcès dont le dernier est resté fistuleux	Do.	...	8 mars 1881	Résection de 3 millimètres	20 do.	...	Do.	0.	

Résumé Analytique de Cent Observations de Résections avec Greffe par Restitution.

100 Observations.	Sexe des Sujets.		Age des Sujets. Années.								Dents Affectées. Incisives		Canines.		Prémolaires.		molaires.		Co-existence de Caries.		Nature des Accidents.					Etendue moyenne de la Résection.	Durée moyenne du Traitement.	Obturation de la Carie.		Résultats.		Malades.		Complications.	
	Masculin.	Féminin.	0 à 10	10 à 20	20 à 30	30 à 40	40 à 50	50 à 60	60 à 70	70 à —	Inférieur.	Supérieur.	Inférieur.	Supérieur.	Inférieur.	Supérieur.	Inférieur.	Supérieur.	Avec.	Sans.	Congestion sans Abcès.	Abcès et Fistules alvéolaires.	Abcès et Fistules cutanées.	Kystes périostiques.	Nécrose des Maxillaire, Ablation de Séquestres.			Hors de la Bouche.	Sans Obturation.	Guérisons.	Insuccès.	Revus après Guérison.	Pas Revus.	Sans pendant le Traitement.	Diverses pendant le Traitement.
	70	30	0	17	42	24	14	2	0	1	10	27	1	5	5	20	22	10	71	29	17	41	5	7	30	2 mill. 6	18 jours.	44	56	92	8	82	18*	75	25
	100		100								100								100		100							100		100		100		100	

* Dont 8 Incisives.

ou bleuâtre que présentent constamment les dents frappées de périostite chronique du sommet. Cette coloration est même un signe important de diagnostic.

Le succès de la greffe par restitution réside donc entièrement dans l'existence d'une étendue de périoste suffisante et formant, ainsi que nous l'avons dit, une bande circulaire complète autour de la racine. La présence de cet anneau membraneux est une condition absolue, que tous les cas d'élimination sont dus à l'interruption dans la continuité de cette surface vasculaire.

Il arrive parfois, en effet, que les phénomènes de la périostite ont amené la production de quelques fusées purulentes qui se sont fait jour, au bord même de l'alvéole autour du collet. Le périoste a ainsi subi, dans le sens vertical, une mortification ou suppuration de son tissu, et la coulée purulente qui en résulte devient la cause presque absolue d'un insuccès.

L'échec de la greffe se manifeste ainsi dès les premiers jours par une élimination pure et simple de la dent entraînée par la suppuration de l'alvéole et du foyer.

Quant aux résultats définitifs que nous a fournis cette méthode opératoire, ils sont établis sur un chiffre de cent observations résumées dans le tableau précédent (v p.p 449-464).

Nous terminons enfin cette communication en mettant sous vos yeux le résumé même de notre pratique sous forme du dernier tableau, que voici (p. 465).

Replantation.

Dr. W. Finlay Thompson, London.

The subject of replanting teeth, although frequently brought before the dental and medical professions, does not seem to have been thoroughly investigated by either body; yet it is one in which of late so many instances of treatment, successful or otherwise, have been recorded, that its discussion is not only permissible, but even necessary; and as the disquisitions of this Congress will undoubtedly bring it into more prominent favour, or tend to cast it into oblivion, I submit the following questions, hoping that they may bring out a full expression concerning it :—

I. Shall the system of replanting teeth, under any circumstances, be a recognised operation in dentistry? and, if so, under what pathological conditions should this means be employed.

II. What advantages, in contradistinction to the disadvantages, may be claimed for replanting? Also, what percentage of cases are successful?

Before entering upon the practical bearings of the subject, it would be well perhaps to briefly consider the structure of a membrane upon which replantation is wholly dependent for its success.

The peridental membrane is an organized tissue which must be considered under two aspects—its relation to the vascular alveoli, and to the non-vascular cementum of the teeth. Its office, however, is similar under either aspect, as it acts as a periosteum or nutrient membrane to both, though modified in its action, and even in its texture, to a degree commensurate with the difference existing between the compact cementum and the soft cancellated alveolar tissue. Owing to the intimate relation of the peridental membrane to these two sections, it may—in the absence of pulp irritation—be considered the important factor in lesions connected with the teeth. It is chiefly composed of white fibrous connective tissue, and has a rich nerve and blood supply, while nucleated masses of protoplasm are to be found in every part. The wavy character of the fibres is more pronounced when seen in longitudinal than in transverse section Their general course is oblique from the bony alveolus to the cementum, without break

or interruption. According to Waldeyer, the nerve supply is abundant. The larger blood-vessels ramify in a general manner; those from the gum and alveolar surface also anastomose in its substance. The smaller masses of protoplasm are chiefly connective tissue corpuscles, while those near the bone and cementum form the osteoblasts. It is to the vitality and functions of these histological elements in particular that we must have the greatest regard in considering or treating any pathological condition of the dental periosteum.

Reverting to the first question, "Shall the system of replanting teeth, under any circumstances, be a recognized operation in dentistry?" the recorded instances of success in replanting have perhaps been looked upon as evidences of a certain power in Nature not practically available, and consequently classed with other curious anomalies in the transposition of tissues. Want of success, through operating under incompatible conditions, has discouraged some from following to its conclusion a method which certainly has, in some instances, been practised advantageously. These remarks must not be misunderstood; for I contend that the system of replanting should not be introduced in practice, save in severe and otherwise hopeless cases, and it is to these alone that reference is now made.

In regard to the physiological action in the reunion of the tooth with the alveolus, we can only reason from analogy. The evidences, however, of the existence of a perfect reticulum of connective tissue with fibres and protoplasmic cells are abundantly proved. In fact, the osteoblasts accumulate in such numbers on the surface of the cementum, that, in certain inflammatory disorders, they act antagonistically, removing part of the cement, producing characteristic striæ and depressions. The office of protoplasm in the reparation of dissevered tissues is so well known that I need only call attention to the existence of this germinal matter in the peri-cementum to at once establish a *primâ facie* evidence of the probability of the reunion of a tooth with its socket, through the intervention of the alveolo-dental membrane. As we see by an examination of the peri-cementum, there are, in the healthy condition of the tooth, immense numbers of masses of living matter in connection with the various parts entering into its composition. In health, these germs go through their proper changes and perform their proper functions. In diseased conditions, or in any departure from the healthy state, these protoplasmic bodies are also the principal agents, and, in such departures from the healthy state, they are excited to action by excessive supply of pabulum, which causes each individual mass of living matter to live faster than it should—*i.e.*, it takes up more pabulum and converts this into more living matter like itself than it does in the normal condition; it becomes enlarged, it divides and sub-divides, and multiplies to such a degree that, in the place of the healthy tissue, we have a pus formation. The protoplasmic bodies in the blood—or white blood corpuscles—also actively assist in the inflammatory process. In recorded cases, it is stated that teeth have been successfully replanted without peri-cementum upon them. The means of union in such cases I shall not now discuss, but, at the end of my paper, this subject will be indirectly included in a question I shall then put to the meeting; yet it may not be without interest if I cite a case which lately came under my care, where the return of the tooth to its socket was, from various causes, delayed for twenty-five hours. In this interval, instead of being kept in a solution of salt and water, it was encased in bibulous paper moistened with carbolized water. The tooth, after being returned to its socket, appeared for a time to progress favourably; but was, notwithstanding, ultimately lost. It is a question whether this destruction of vital power was not in consequence of too long an interval between extraction and replanting, or whether the carbolized water destroyed the protoplasmic germs which were to, in part, restore vascular circulation between the alveolus and the

peri-cementum. I infer that, in the necrosed condition of the periosteum, which was not tolerated by the plastic effusion from the alveolus, sloughing resulted, rather than any fibrous connection with the cementum.

There is, even in successful cases, great difference in the stability of replanted teeth. In some, considerable mobility exists, indicating a lax fibrous attachment; this sometimes occurs in undrained teeth, caused, no doubt, by the retention of septic matter, or effusion of inflammatory products into the connective tissue. In others the fixed condition of the tooth suggests anchylosis. These cases are usually found where drainage has been provided for, thus permitting egress of the morbid accumulations from suppuration, as well as the sequelæ of organizing inflammation.

Whether the inflammation be acute or chronic, the practice of replantation demands parallel procedure—viz., the removal of all the disintegrated periosteum, the destruction of the sac at the apex of the root, and the careful polishing of the cementum where the osteoblasts, from inflammatory influence, have reversed their function and begun to reabsorb the osseous structure of which they were originally formative. This process may vary in its intensity from merely causing microscopic pits in and prominences on the cementum, to the dissolution of that tissue, and ultimate wasting of the root of the tooth. It was this condition which suggested to me a possible advantage of capping. Of the subject of capping I shall shortly treat.

II. What advantages, in contradistinction to the disadvantages, may be claimed for replanting? Also what percentage of cases are successful?

Those who have treated chronic alveolar abscess must, at times, have experienced the uncertainty of their efforts. Day after day, perhaps for weeks, and even months, have patients been subjected to the inconvenience of almost daily attendance upon their dentists, with but doubtful benefits being conferred, resulting, perhaps, in only temporary retention of the tooth. Shall we not consider this a case open for the adoption of any means promising relief? Then, again, there may be conditions under which the time required cannot be devoted to the case, as often happens when parties come from a distance. If treatment calculated to secure a valuable organ can be performed in a single sitting, shall we not deem it a justifiable procedure?

The operation is one which, from its very nature, must be brought to a quick conclusion. Although, between the intervals of extracting and restoring the tooth again to its socket, several hours may elapse, no unnecessary time should be wasted in its return.

It may be alleged that the severance of the contiguous tissues, and the disrupture of the nutrient vessels, is of such a character as to preclude solid reunion of the cementum, of the peri-cementum, and the gum and alveolus. That the reunion may partake of the nature of a "seamed scar," and therefore be so far incomplete, I shall not attempt to refute; but that it is sufficient to continue the low vitality required to ensure the retention of the tooth is now fairly well established by the lapse of years in cases of replanted teeth, which are apparently sound and useful to this day. As an instance—

A patient of the late Mr. Edwin Sercombe, who came under my care for general treatment of the mouth, gave me the history of a second inferior bicuspid replanted some ten years before by that gentleman. The tooth was not discoloured, and it had every appearance of being alive. A slight retrocession of the gum and alveolus had taken place, but not to such an extent as to cause any inconvenience. Numerous other equally successful cases have been recorded.

Perfect restoration of the tooth can also be made where ugly forms of decay extend under the gum to almost inaccessible positions, with a perfection limited only by the skill of the operator, as his ability is not then dependent on the endurance of the patient,

whose irritability ceases to be an element in the difficulties of the operation. This advantage, however, should in no way bias a practitioner in the treatment of any case.

The extraction, performed under the influence of nitrous oxide, is of course, painless; and when the manipulation of the tooth is complete, gas may again be called into requisition in this the only part of the operation from which any further acute pain may arise. Once the tooth is established in position and carefully adjusted in respect to its occluding surfaces, rarely more than tenderness and uneasiness of a few days' duration are experienced.

Having viewed one side of the question, I shall proceed to consider the disadvantages that may be claimed in opposition to it.

We have to combat the antagonism which naturally arises from the mere mention of an operation, the peculiar nature of which is repugnant to the feelings of the patient. From the limited general information, or, perhaps, lack of personal experience in connection with the subject, its results are undoubtedly, at the present time, sceptically received by the profession.

The nutrient structural attachment being ruptured, time will be required to establish reunion of the parts. For several days the tooth must be considered an object of constant care by the patient, who will occasionally be annoyed by its occlusion with the opposing teeth. Although uneasiness may be experienced as an accompaniment to the operation, it is doubtful whether the actual pain is in excess of that caused by local applications.

The next restraining influence in the practice of replanting, is the uncertainty and known danger of extraction; this is hemmed in with circumstances quite beyond control. The shape of the alveolus and of the tooth would, in many instances, enable a favourable prognosis of extraction, yet in some cases it is impossible to accurately predict the result, for the divergence or distortion of the fangs may be so great as to cause fracture of the alveolus or of the root itself, while this same distortion may preclude the return of the organ to its socket.

In considering "What percentage of cases are successful?" I shall first briefly describe the system of treatment which I have adopted. In cases of chronic abscess and where the apex of the root has lost its periosteum, the denuded portion of the root has been excised, and restored with a gold cap, the object being, if possible, to prevent absorption. To remove inflammatory products, instead of drilling through the alveolus, or cutting a gutter along the roots, a tube has been fixed in the pulp canal, extending from the apex of the root to the grinding surface. From my experience I do not now ascribe much of the success that I have had to the cap; but the tubing, inasmuch as it permits of drainage, I deem important. How far the cap has met the object for which it was intended, I am unable at present to give any reliable information, simply from the fact that, in every case where the tooth has been retained for a period of over fifteen days, I have *had no opportunity of again seeing it.* That this foreign substance has been tolerated by the living tissues is a well-authenticated fact, the physiological effects of which must for a time rest in abeyance.

I have spoken of the difficulty, in some instances, of returning teeth to their sockets. A case illustrative of this came under my care some two years since, the tooth being a superior first molar, and the palatal fang standing at an angle of about 35°. The tooth having for a long time been affected by chronic abscess, and the lady being non-resident in London, with only a limited time which could be devoted to treatment, I decided to extract, fill and replant it. The tooth was removed at twelve o'clock and returned at seven P.M. same day. Three-fourths of the crown had been destroyed by decay, and the post-proximate aspect was broken down far below the margin of the gum. This is undoubtedly a case that I should have failed in again restoring to the mouth had it not

been for the kindness of Mr. Woodhouse Braine, who rendered me valuable assistance in keeping the patient under the influence of gas while it was both taken out and returned to its socket. I make particular mention of the gas in this case because I was not able to re-establish the tooth in its position until I had used almost the same force in its return that I did in extracting it. The lady called some time since, and, having occasion to take nitrous oxide again, it gave Mr. Braine an opportunity to examine the condition of the tooth. The lady stated that it had done the best of service; and, after the first few days, had occasioned her no discomfort. In this case the tooth seems fixed—a condition that I am not prepared to say is an advantage.

During a visit of Dr. Wm. N. Morrison, to London, replantation was a subject of considerable discussion between him and myself. I was then endeavouring to investigate the practical results (if any) that might be obtained by this method; and my conclusions are drawn from results extending over a period of three years. For the first two years I made it a special point of interest to obtain as many cases as possible. During the last year, however, I have only replanted four teeth. My observations have been made principally upon people in the lower walks of life. Many cases I have completely lost sight of, so that my failures may not all be recorded.

Number of teeth replanted (estimated)	80
Lost, as far as known	8

The losses were as follows:—

From non-union	5
Imperfect union; three months' retention	1
Abscess recurring	2
Lost cases, as far as known	8

Of the eight lost, five were not tubed. Of the remaining three tubed, one abscessed again, and the other two were lost from non-union.

Of the number of teeth replanted, I am not able to state the exact proportion tubed, but I estimate it as something over 50 per cent.

During the last twelve months, the number of teeth replanted by me has been:—

In private practice	1
Hospital patients	3
	4

Before closing, I desire to call attention to the subject of transplantation of tissues; and, through the kindness of Mr. C. Macnamara, Surgeon to the Westminster Hospital, I am permitted to refer to a case which has been of considerable interest to me. Mr. Macnamara seems to have been influenced in the treatment adopted by what he had seen in connection with teeth replanted. It is (so far as I know) the second instance only in which transplanting of bone has been effected of the same nature and of so extensive a character, and, thinking that it might possess features of interest to this Congress, I have, with the consent of Mr. Macnamara, arranged for as many to see the case as would like to do so. The clinical notes handed to me are as follows:—

"S. W., aged 6, was admitted into the Westminster Hospital, August 10th, 1880, suffering from necrosis of the upper extremity of the right tibia. The inflammation extended to, and destroyed, the shaft of the bone. Mr. Macnamara consequently, on June 2nd, 1881, removed the dead bone, that is, the entire shaft of the tibia, the upper and lower epiphyses being left in situ, and as much of the periosteum as could be saved. The wound healed, but no new bone formed, so that the child's leg was useless.

"On May 21st, 1881, Mr. Macnamara determined, if possible, to plant small fragments of bone in the situation of the lost tibia, in the hope that they would produce a new bone. Having a case of amputation of the foot for deformity, the bones of the tarsus were, immediately after its separation from the body, divided into small pieces, and an incision having been made along the front of S. W.'s leg, from the upper to the lower epiphysis, fragments of bone were placed along the situation occupied by the former tibia; the edges of the wound being then brought together. The operation was done under the carbolic spray and antiseptic dressings.

"Two days after the operation, on removing the dressings, there was found to be some tension about the wound, and the sutures were consequently divided and taken away. On the third day, several of the fragments of bone planted in this child's leg were seen to be vascular and attached to surrounding living structures; they have since grown, and are now covered in by granulations. So far as can be ascertained at present, there seems good hope of sufficient osseous tissue remaining and growing in the leg to produce a new tibia."

In sub-periosteal operations, the physiological changes that take place in the membrane to elaborate new bone seem almost incomprehensible. This reproductive power was strikingly evinced in another case, the particulars of which have been kindly furnished to me by Mr. Macnamara.

"A. L. was admitted into Westminster Hospital under my care on the 26th of March, 1879, with acute necrosis of the upper extremity of the right tibia, and consequent septicæmia, from which the lad remained in a most critical position for nearly a month. He then got so far well as to enable me either to amputate the limb or to take away the shaft of the tibia without removing the periosteum. I determined on the latter operation, and the section of the shaft of the tibia removed is exhibited in the Museum of the International Medical Congress, No. 19. The boy recovered well from the operation; and, from the periosteum I left in his leg, not only has a new tibia grown, but the bone is larger than we know what to do with. The patient has got a good knee and ankle-joint, and can walk about perfectly well."

These two cases possess many points of interest which bear upon the subject of replantation of teeth. One question, at least, I should wished discussed here, is, what points of analogy or of difference are there between the nature of the repair and of bone-formation in such instances as these cited by Mr. Macnamara, and the repair and re-attachment which takes place between the bone of alveolus and the cementum of a replanted tooth?

The vivacity of the periosteum, and the reparative action it is shown to be the seat of, together with the pathological and even destructive functions, it is capable of performing, renders a more perfect knowledge of the structure of that tissue, in its several positions and relations, a matter of the greatest importance to prevent error even in such operations as the replantation of teeth.

DISCUSSION.

Dr. Taft, Cincinnati: This is an operation rightly entitled to earnest consideration. The occasions for the replantation of teeth occur (1st) in the accidental removal of sound, healthy teeth, by whatever means, from persons of good system and condition, and under forty years of age; (2nd) in those teeth from which abscesses issue upon the surface of the face, especially those of long standing; (3rd) in those having abscesses issuing in the mouth, persistent and unyielding to the ordinary treatment. These I regard as the only indications for replantation. In respect to the first, if there has been laceration of gum, or fracture of alveolus, there should be adjustment and retention of such parts in

proper position, before or at the time of replacing the tooth. In the second class of cases, after the extraction, all débris should be removed from the root, any necrosed alveolus should be removed, adhesions released, and the tooth replaced. In reference to the third, the removal of all excrescences from the root, and freeing the socket from everything adverse to repair, is a necessity. The means of re-attachment is cicatricial tissue, the physiological function of which is much like that of the original structure, although less resistant, so that disease and wasting is more likely to take place under the influence of irritants, mechanical or chemical. Cicatricial tissue is found after nearly all surgical operations, and is no more objectionable in fixing replanted teeth than in other parts. In the operation of replanting, the root should be carefully freed from all extraneous material, the socket must be freed from coagulum, and anything else that would be an obstacle to the process of repair. The tooth is then to be carefully replaced and retained in position till union takes place. This should and will take place in favourable cases without active inflammation or suppuration. The operation of replanting should only be employed as a last resort.

Dr. Jos. Iszlai, Buda-Pesth: I will relate a case in my practice, which bears on the present subject. A pretty young lady, fifteen years of age, called on me, wishing absolutely to have a minor irregularity, but one which she considered as very distressing, corrected. The second bicuspid was short, and directed against the first, near to the border of the gums. I proposed to extract the ill-situated second bicuspid, while foreseeing the risk of extracting the first bicuspid, the first molar behind being less in danger. The lady consented, and, on extracting the second bicuspid, the first one also came out with it. I replanted this instantly, and observed the lady four days only, during which no symptoms of excessive reaction came on. I saw the young lady again after half a year, and the replanted tooth had the same colour, same firmness, and sensibility, as its healthy neighbour, and the space was also reduced to less than the half. This case shows also that pulp vessels and nerves can unite by first intention; and Dr. Taft's case points to the same conclusion, as also do the two experimental cases till now known, namely, the one in the anatomical museum of Bonn, made by Wieseman five or six decennia ago, and the other in Berlin, made by Mitscherlich nearly two decennia ago.

Mr. Coleman, London: About fourteen years ago my attention was attracted to this subject of replantation in connection with a dental disease, which I might designate as having almost invariably a fatal termination. I allude to cases of chronic peri-odontitis of long standing. The operation was a very old one, but, as shown by the last speaker, had never for certain cases been abandoned; but there might be some novelty in going contrary to the opinion of almost all who, up to that time, had written upon the subject, and who, with hardly an exception, laid down the rule that a diseased tooth was on no account to be returned to its socket, and *vice versâ*. Believing, however, that by the aid of antiseptic agencies one could bring a diseased tooth, or rather the diseased portion of a tooth, to a condition in which they would be tolerated by the system, I commenced treating such cases by removing portions of diseased alveolo-dental membrane, exposing the diseased portion of dentine to antiseptic agencies, and then returning such a tooth to its alveolus. My success was not great, and this, coupled with certain unavoidable circumstances, led to my ceasing to continue my experiments to any extent. I, however distinctly laid down my opinion at that period, that I felt convinced that, if the experiments were continued, and the failures duly investigated, that, under more favourable and better-recognized conditions, the operation might not only become legitimate, but positively the most successful, and thus might be likened to ovariotomy,

which, in its early adoption from the Continent in this country, was attended with such fatality that the high authority who presides over the Section of Surgery of this Congress pronounced it an unjustifiable one, but gracefully withdrew his opinion when Mr. Spencer Wells brought several hundreds of his cases to such successful issue. With regard to the question of success, that might be looked upon from several points of view; but I consider an operation a success which prolongs the existence of a tooth in a state of usefulness and comfort for even a few years. A physician or surgeon would regard a case successful in which he prolonged the existence of a patient for even a few years. No life of a patient could be said to be saved; the patient eventually would die; life could, for however long a period, be only prolonged.

Mr. Spence Bate, Plymouth: My earliest experience on this subject commenced in 1836, when a student in the surgery of a general practitioner. I extracted a lower bicuspid for a young woman, who, when the tooth was out, regretted that she should lose one so little decayed. I replaced the tooth, which, after some local irritation, again united and fulfilled its career. My next was in or about 1846, when I was visited by a gentleman who had had some five or six teeth knocked out by coming into contact with the working machinery of a steam-engine. These he picked up and re-inserted in the mouth. Without again removing them, I secured them in position by the assistance of a silver plate. They all became in a short time firmly fixed and useful organs. More recently a case came under my treatment that exhibits interest of a higher degree. It was a front incisor that had been fractured by a fall, and complicated with a large abscess. I determined to remove and replace it by a rather large lateral incisor that was irregularly implanted within the dental arch. This I did, and having the opportunity of seeing it some three, and again eight, years after it was done, I was gratified to find the re-implanted organ in as good a condition as any other in the mouth. Several cases I have known treated as Dr. Magitôt has stated to be his plan. In any case where, either from inflammatory action or artificial agency, the periosteum has been removed, the exposed cementum becomes necrosed. In fact, if it should be otherwise, we must be prepared for a total distinction in the surgical treatment of the teeth from that which we find to be the case in the treatment of bone. For I believe that no surgeon would ever expect bone to live, when implanted in the living tissue, if he removed the periosteum from it; neither is it to be expected, in the history of the dental tissues, that a tooth will live with the periosteum gone. To succeed in replantation, my experience is that the root of a tooth should be well protected with the healthy peri-odonteum. With respect to the treatment of a peri-odontitis, it appears to me that the extraction of the tooth and its re-implantation is an extremely undesirable treatment to pursue, where a less painful one and, in my experience, a more certain, is available. It has been my practice for years, and with a success that is of a high average, in cases of peri-odontitis that cannot be reduced by external application, to perforate, with the assistance of a boring-engine and a broad-pointed sharp drill, the alveolus through the gum, as near the centre of the disease as possible, to follow this with a pledget of cotton dipped in strong carbolic acid, and the next day repeat the same with glycerine, and camphor, and chloral. I do not remember a case wherein the pain was not relieved and the cure made permanent.

Mr. Browne Mason, Exeter: I can bear testimony to the success of replantation in cases of removal by accident of healthy teeth. One case, in which I have had the most frequent opportunity of since observing the patient, was a young lady who lost a lower bicuspid through its being dislocated by the removal of the first molar. It was care-

fully replaced, and showed, by its sensitiveness to changes of temperature, that union of pulp had taken place. The replantation was performed at least twelve years since, and the patient since has had no subsequent trouble. I have never performed this operation on a diseased organ, but have found the results were satisfactory in the few cases I had the opportunity of subsequently inspecting.

Mr. Balkwill, Plymouth: In replantation, the danger is generally dependent on the shape of root; if of normal shape, it may be generally successfully undertaken; but opacity has sometimes been seen showing death of pulp. Re-establishment of vascular circulation in the pulp wants more confirmation, although probable; in some cases a misplaced tooth may be forced into the position of an extracted tooth. A case was mentioned of the successful transplantation of two canines which were crowded out of the arch, into the alveoli of the first bicuspids which were decayed and immediately previously extracted. It was observed that after replantation for chronic inflammation, the periosteum having been removed, absorption of the root is a not uncommon result. A case was given in which absorption occurred to a healthy tooth after replantation.

Mr. Percy May, London: The following case occurred in my practice:—The second right upper bicuspid was extracted (for what cause I could not gather from the patient) about eighteen months ago, and replaced without further treatment, I believe, than merely removing a portion of the apex of the fang rounding it off, rinsing the mouth and tooth in warm water, and then inserting it. A piece of cotton wool was placed between the back teeth for a "few hours," and if pain continued, the patient was directed to "hold warm water in the mouth constantly." When I saw her a few months since she desired me to extract the tooth, "as it was painful if anything hot or cold touched it, or upon biting hard substances, and it was accompanied with a constant slight discharge," I found slight tenderness upon percussion, pus welled up by the side of the tooth upon pressing the gum, which had receded beyond the neck of the tooth, but it was firmly implanted, and "except the first few days had never been at all loose." The tooth, which was exhibited, showed great absorption of the apex of the root.

Dr. Atkinson, New York: My complaint is, that we have before us to-day only early examinations, without waiting for that ripening of instruction that comes through the accumulation of observations; and a recording only, under the individual perception, and not strengthened by the conversational method of many minds competent to examine and decide. We heard yesterday, from the renowned Professor Owen, that, in so far as professional learning was based upon science, it was—those three beautiful words which he used—viz., "Novelty, utility, charity"; but, when it was only guess-work, honest men ought to move cautiously. Inasmuch as I have a paper that I hope to read before this body, on the reproduction of bone, with special reference to the variable portions of the maxillary bones, I deem further remarks unnecessary.

Evidence of Reflex Action, in relation to Constitutional Disturbance, induced by Interrupted Secondary Dentition, and coming under the personal observation of the Author.

Mr. D. Corbett, Dublin.

It is with no small amount of diffidence and hesitation I venture on the introduction of a subject so complex in its nature, and at times so difficult of comprehension, as

reflex action; but cases will arise in medical practice, where the physician, if he means to act conscientiously and with benefit to his patient, cannot afford to ignore the advice and services of the dental surgeon. For some years, reflex action in connection with the teeth has been to me a constant source of study and observation; and during the lifetime of my friend, the late Dr. Hudson, I had several opportunities, through his kindness, for proving the truth of my diagnosis of cases occurring in his practice, when the symptoms to be combated were anomalous and inexplicable, according to received doctrine and authority.

Reflex action, as a phenomenon, is perhaps more frequently observable in youth than in mature age; at least, such has been my experience; but, practising a speciality, I may be excused if I be inaccurate in my statement; however, this fact I do maintain, that the period of secondary dentition is replete in many instances with evidence to prove the importance of my statement.

The first important connexion of the fifth cerebral nerve with the sympathetic is observable, as you are aware, with the "Gasserian Ganglion," the first division of which, the ophthalmic, as it enters the foramen lacerum, receives some sympathetic filaments. It then divides into three branches, the lachrymal, frontal, and nasal. I wish you to remember this particular relationship, as it bears strongly upon the first case I shall allude to.

Case 1.—Some years since, the late Dr. Stronge called upon me with reference to a case of, to him, much perplexity. Miss Q., a young girl, aged fifteen years, of nervo-sanguine temperament, healthy in every particular, was subject to copious lachrymation, on each occasion that she left the house for outdoor exercise; there was no outward manifestation of organic disease, the eyes looking brilliant and healthy, still, the moment she went into the open air, the tears poured down her cheeks in a most distressing manner. Dr. S. tried every plan he could think of to overcome the affection, without any beneficial result. Consultation was had with several medical men in vain as regards improvement. After several months of suffering, the case was brought under my notice, to ascertain if the teeth could in any way influence the condition of affairs. On examination, I found the cuspidati of the upper jaw absent, though the dental arch was perfect. Understanding that no teeth had ever been extracted from the child, I at once removed the first bicuspid at each side. Within one week, a manifest improvement was observable, and within three months all inconvenience had passed away—when the cuspidati made their appearance. I have seen this case within the last year, and can vouch for the perfect regularity of the dental arch.

Case 2.—Mrs. A—— called upon me relative to her ward, a little girl, aged thirteen years, of weak intellect from infancy, but docile and tractable, until the period of the second dentition, when a marked change was observable in her conduct and disposition: she became at times violent and subject to paroxysmal attacks, causing her to run about the room biting at everything within her reach, the chairs, tables, and door-handles. In the street, she would run off from her attendant, and attempt to bite the lamp-posts. Her teeth appearing to require attention, the child was brought to me for advice by her guardian, who gave me leave, if it should be necessary, to remove any teeth, to be prepared for unusual resistance on the child's part, and act accordingly. I found the incisors of the lower jaw overlapping each other, as also the cuspidati pressed forward in a most unbecoming manner. I at once removed the first bicuspid at each side, and directed the child to be brought to me after a month's interval; this was done, when I learned that though no improvement had been observed in her mental condition, the biting propensity had completely disappeared.

Case 3.—Dr. R—— having called on me with reference to some artificial teeth he re-

quired at a subsequent visit, incidentally mentioned, as a source of great anxiety to him, the state of his daughter's health, aged seven years, which he described as follows. "Nothing unusual in her condition since birth was observed, until within a period of two years, when weakness of the lower extremities showed itself, accompanied with occasional impairment of vision. This state of things gradually grew worse, until the power of progression was quite gone, unless assisted, and there was complete loss of vision when she assumed the erect from the sitting posture, though in the latter she could distinctly see large objects."

As her condition had resisted every description of treatment, I asked her father to allow me to examine her mouth, to which in consultation with her medical attendants he consented. I found the dental arch in the lower jaw complete as to number. The dentes sapientiæ only partially erupted, the circumference and superior aspect fully exposed, but still giving unmistakable evidence of severe pressure against the second molar to the extent of slight lateral displacement outwards. I extracted the second molar at each side; within one week a slight improvement was observed, which gradually increased, until three months had passed when every iota of constitutional disturbance save one had disappeared—the power of vision in the right eye was lost, but she is now in the enjoyment of the most perfect and robust health—I have seen this lady within the last few days, and have had from her an expression of gratitude for the service I had rendered her.

To account for these results, the idea occurs that in the connection of the sentient fifth with the sympathetic nerve, there may be a recurrent stream of nervous influence flowing, which, as it were, by inoculating the whole sympathetic system, would account for the exhibition of those very anomalous symptoms observable in parts of the human organism, remote from the primary source of irritation.

On Erosion.

Mr. Alfred Coleman, London.

I too well remember having said on a public occasion "that papers written to order rarely contained anything either original or interesting," but, at the time, I little thought how soon I should illustrate my own statements. From those friends, whose persuasions led me into the scrape, I have a right to look for some indulgence, but in regard to the majority of my hearers I can only throw myself upon theirs.

Erosion or decay by denudation has had, to different individuals, different meanings, it is therefore desirable at the outset that I should at least define the subject on which I propose to treat. Thus some, Bourdet for instance, consider the former to comprehend what we, in this country at least, comprehend under honeycombed teeth, whilst Wedl describes it under the title "caries of cementum." "These carious excavations," he says, "usually have sharp edges, are patelliform, and occasionally occur without any affections of other portions of the tooth." He also evidently classes the honeycombed teeth under the head of erosion, as he states in a note with respect to these, "These malformations are considered, without reason by many practitioners, to be caused by hot drinks, sweet and sour articles of food, use of acid preparations for the teeth or other medicaments . . . . but Bourdet, who treated such deformities under the name of erosion, considered them due to rachitis, scorbutus, low forms of fever, measles, &c. . . . . The surgeon Tenon exhibited to Bourdet a series of jaws, by which it could be demonstrated that the erosion took place while the tooth was still within its capsule. Again, Dr. Murinie,

an excellent paper, read before the Odontological Society, June 6th, 1870, entitled, "On some Abnormal and Diseased Dental Conditions in Animals," thus classifies the various conditions under which the teeth incur a loss of substance:—

"Human teeth," he observes, "may suffer diminution in volume by four separate processes, which are respectively as follows:—

"(*a*) By true absorption, equivalent to the normal healthy process which is witnessed in the passage from the deciduous to the permanent dentition.

"(*b*) By erosion, or interstitial change of a chemico-vital character, but differing from true absorption in being the product of abnormal changes.

"(*c*) By denudation, or abrasion, simply slow mechanical rubbing away, either from contact with opposed teeth, or friction of foreign substances.

"(*d*) By force or piecemeal chopping away of portions, variable in size according to circumstances."

In this country, both terms have usually been restricted to one condition, as we shall see in the following short historical notices of it.

Hunter, who appears to have been the first to describe it, and who designated it "The Decay of the Teeth by Denudation," says, "There is another decay of the teeth much less common than that already described, which has a very singular appearance. It is a wasting of the substance of the tooth very different from the former. In all the instances I have seen, it has begun on the external surface of the tooth, pretty close to the arch of the gum. The first appearance is a want of enamel, whereby the bony part is left exposed, but neither the enamel nor the bony part alters in consistence as in the above described decay; and hence it may be called a denuding process. The bony substance of the teeth also gives way, and the whole wasted surface has exactly the appearance as if the tooth had been filed and polished. At these places, the bony parts being exposed, become brown." "I have seen instances where it appeared as if the outer surface of the bony part, which is in contact with the inner surface of the enamel, had first been lost, so that the attraction of cohesion between the two had been destroyed, and as if the enamel had been separated for want of support, for it terminated all at once.

"In one case the two first incisors had lost the whole of the enamel on their anterior surfaces; they were hollowed from side to side, as if a round file had been applied to them longitudinally, and had the finest polish imaginable. The three grinders on each side appeared as if a round file had been used on them in a contrary direction to that on the incisors—viz., across their bodies close to the gum, so that there was a groove running across their bodies which was smooth in the highest degree. Some of the other teeth in the same jaw had begun to decay in a similar manner; also the teeth in the lower jaw were becoming diseased.

"I saw a case very lately where the four incisors of the upper jaw had lost their enamel entirely on their anterior surfaces, and there was scarcely a tooth in the mouth which had not the appearance of having had a file applied across it close to the gum.

"Those whom I have known have not been able to attribute the disease to any cause; none of them had ever done anything particular to the teeth, nor was there any appearance particular in the constitution, which could give rise to such a disease. In the first of these cases the person was about forty, in the last about twenty years of age. From its attacking certain teeth rather than others, in the same head, and a particular part of the tooth, I suspect it to be an original disease of the tooth itself, and not to depend upon accident, way of life, constitution, or any particular management of the teeth."

I have quoted Hunter at considerable length, and for the reasons that, of those who ever wrote on medical subjects, probably no one ever surpassed him in his remarkable

powers of description, and because my so doing will save me from any attempt to define what I regard as covered by the designation of decay by denudation.

Fox, some thirty years later, thus writes respecting it, under the designation "Of the Removal of the Enamel by the Denuding Process." This is a disease producing a change in the teeth by which they acquire an appearance unlike that of caries, but attended with a loss of substance.

"The tooth does not, as in caries, become softer, nor, like that disease, does it originate in inflammation, but it consists in a removal of the enamel from the bone of the tooth, as if by solution and gradual abrasion.

"The first appearance is in the enamel of one or more of the incisors becoming thinner, and appearing as if a small portion had been scooped or filed out, occasioning a slight depression. This removal of the enamel continues until so much is taken away as to leave the bone exposed. As this denuding process, according to Mr. Hunter's term, advances, the tooth changes its colour, gradually becoming yellower, as the bony part is more exposed. When the whole of the enamel is destroyed, part of the bone is also removed, the remainder acquires a brownish hue, is very highly polished, and will often remain in this state for a number of years.

"In some, it appears near the neck, the cavity extending across the tooth, and the disease proceeds until the tooth is nearly divided in two; in this case, whilst biting something hard, the lower part of the tooth usually breaks off, leaving the fang in the socket, and a small portion of the body of the tooth. The molars are more subject to this disease than any of the other teeth. The incisors of the upper jaw are very frequently affected by it, whilst the incisors of the lower jaw seldom become decayed."

Mr. Bell, under the title "Loss of Enamel and Wearing Down of Teeth," thus speaks of it: "Mr. Hunter appears to have been the first writer who described the remarkable and, hitherto, unexplained affection, termed by him "decay by denudation." It consists of a gradual loss of substance, generally without the slightest discoloration or any diseased appearance. In all the cases in which I have been able to observe its commencement, it appears to have begun on the surface of the enamel; in most it attacks, first, the central incisors, sometimes removing the anterior surface of the enamel, either generally or in irregular patches, in either cases making a perfect and regular horizontal groove, which very gradually increases until it has extended through the enamel to the bone." "The groove is perfectly straight and continuous through its whole extent, and is often as regular and smooth as if it had been formed by a fine round file, and afterwards polished; when the bone has been exposed by this process it sometimes becomes very slightly discoloured; but remains for a long time perfectly hard and sound and seldom exhibits any appearance of gangrene. . . . . The most obvious solution," *i.e.*, of the question of its cause, "would be, that it was the result of friction, and I have seen so many instances in which it has appeared to be produced, or at least increased, by the use of rough or acidulated tooth powders, that I should not hesitate to assign to it such a cause, were it not for certain cases which have exhibited this affection to a considerable extent, without any application of that kind having been ever used."

On a discussion upon this subject at the Odontological Society, May 2, 1870, in reference to a case brought forward by Mr. Steele, Mr. Harrison remarked: "That he had seen, in the course of his practice, many similar cases to that which had been brought under their notice by Mr. Steele, and had come to the conclusion, where they could not be traced to mechanical causes, that they were referable to the cause (be it what it might) which produced that effect on the teeth generally known in the profession as "Hunter's denuding process," which he believed was a disease—if it might be called a disease—the cause of which had not yet been discovered. This view of the

subject opened, to his mind, a very interesting question for their consideration, but one which, of course, they could not go into at any length that evening, as they had before them a paper on a different subject for which the evening had been set apart. He might, however, perhaps be allowed to state a few facts which had come under his observation, with reference to this disease, or peculiar condition of the teeth so frequently met with, as the subject had turned up incidentally, which he thought would be interesting to the Society, and which he would not occupy much time in doing. It was, as they all knew, attributed by most modern authors to the use of the tooth-brush, abrading tooth-powders, and other similar mechanical causes. That they were constantly meeting with cases of ordinary abrasion of the necks and of the surfaces of the teeth produced by these causes he (Mr. Harrison) was ready to admit; but he had never been able to consider the peculiar affection described under this name by Hunter as being produced by these causes, because they were constantly meeting with cases of it in which the depressions were so deep, as compared with their breadth, and in which, moreover, they were sometimes so sharply undercut, that it had always appeared to him impossible that they could be produced by the use of an ordinary tooth-brush and any tooth-powder; and he had not been many years in practice before he became convinced of this, from finding well-marked instances of this disease, or peculiar condition of the teeth, in some of the lower animals. After much consideration given to the subject, he had, at one time, come to the conclusion that it must be produced by the action of certain absorbents in the teeth themselves, not yet discovered; and he had nearly settled down into that belief (although there were almost irreconcilable difficulties in the way of it), when the following curious case caused him to suspend, if not to relinquish, this idea. A patient of his had worn for some years a complete upper and a partial set of artificial teeth, when, in consequence of having to lose some of her remaining under teeth, he made her a lower row, carved out of the hippopotamus tusk, to wear temporarily until the gums should be in a state to receive a new lower set of a more permanent character. She was so comfortable, however, with this temporary set that, instead of wearing it for a few months only, as was intended, she wore it for eighteen months or two years, when she came to him to have the permanent lower set made. On removing this temporary set from the mouth, he was at once struck with the appearance presented by its front teeth—they having a number of transverse lines of indentation running across them, from about canine to canine, exactly resembling this so-called "Hunter's denuding process." He drew the patient's attention to these lines, and asked her whether she had cleaned these teeth with any particular tooth-powder, or in any other particular way, which could have produced this effect. Her reply was—"That she had not, and that she had merely washed them with her tooth-brush and water with occasionally, perhaps, a little soap." He then asked her whether she had been in the habit of rubbing the front teeth more freely and with more force than the side teeth; but her reply was—"No, that she had rather been in the habit, if anything, of rubbing the side teeth most freely, inasmuch as they had soon become the most discoloured." Struck with the similarity of these lines to what was known as "Hunter's denuding process" (as he had already said), he was set speculating as to the probable cause of them; and the best conclusion he could come to on the subject was, that they were in all probability produced by some peculiar action of the secretion, or of the absorbents, or of both, of the mucous membrane of the lower lip, and that, if so, "Hunter's denuding process" might arise from the same cause; and thus it was that this case went far, at any rate, to upset his previously existing notion that the latter disease arose from the action of undiscovered absorbents in the teeth themselves, if it did not entirely dissipate it. He begged to be understood, however, as throwing out

this latter view merely as a suggestion, and not as a decidedly formed opinion; and would be glad if, in the interest of science, some enthusiastic physiologist and pathologist amongst them would take the subject up, and endeavour to work it out.

Messrs. J. and C. S. Tomes in a "System of Dental Surgery," second edition, give a good description of the appearances presented in the affection. They say: "Now and then the teeth are attacked in portions inaccessible to the tooth-brush; thus in the canine here figured, the groove was not only upon the anterior surface, but extended back on both sides of the neck of the tooth. Moreover, it was distinctly undercut. . . . . Although the labial surfaces of teeth are usually attacked, the lingual surfaces may, in some few instances, be eaten away; in the two incisors here figured this has taken place, the gum having at the same time receded. The cause of these various forms of erosion has been from time to time the subject of great discussion; though some hypotheses, such for instance as that which attributes it to disease inherent in the dentine, may at once be dismissed. It has been already shown that mechanical abrasion will not serve to account for all the cases. Absorption cannot be called in to account for the removal of the tooth substance, for it often takes place at spots remote from any structure capable of developing an absorbent organ, and it seems that we must fall back upon the idea that it is an example of chemical solution. But whence the solvent comes, and why the affected surfaces are not the site of ordinary caries, are questions which remain unsolved, though it seems probable that mucus, by fermentation or affording a nidus for fermentation, may provide an acid solvent." Under the head of abrasion the same author writes, "Another form of abrasion is that which is occasioned by the action of the tooth-brush on the necks of the teeth, or upon such parts as are but indifferently protected by the enamel or the gum. The teeth become very gradually indented by highly polished transverse grooves."

The occurrence of such grooves has been by many writers supposed to be independent of a mechanical cause. But in many cases, which have come under my own notice, the grooving could be attributed to the action of the tooth-brush, or to mechanical action, in some other form. The most prominent teeth are invariably the most deeply cut, or those teeth in which the enamel is obviously defective.

Dr. Magitôt thus describes the affection, and suggests its probable cause: "The cavity then presents the peculiar appearance which may be compared to a saw-cut, polished, hard, and resistant. Such are the cavities which Duval and several other authors have designated under the name of 'Caries Simulating a Wearing Away,' and of which the mode of production has not been explained. They have in effect all the appearances of true wear, but my observations upon the succession of different periods in the malady have demonstrated that these clean and polished notches are nothing else than caries of the neck of the tooth passed to the condition of spontaneous cure or dry caries."

Salter in his "Dental Pathology and Surgery" does not allude to the affection.

From the quotations I have given, from the works of chiefly English writers, it will, I think, be admitted that they do not materially differ in their descriptions of the appearances the affection presents; their differences appear when they come to assign to it a cause, and here no doubt their opinions are worked by their own special views with regard to dental caries, and with which they, more or less, associate this. In one respect, however, their differences are somewhat marked, namely, with regard to the various teeth that are most liable to it. Hunter, whilst stating that it attacks certain teeth rather than others, does not specify which; but if we take the cases he cites as typical ones, it would appear to be the incisors and molars. Fox, apparently, contradicts himself on this head; thus, he says, in one place, "The first appearance is in the enamel of one or more of the incisors;" whilst later occurs the remark, "The molars are more

subject to this disease than any of the other teeth. The incisors of the upper jaw are very frequently affected by it, whilst the incisors of the lower jaw seldom become decayed." Bell says, "In most it first attacks the central incisors."

My own observations would lead me to differ somewhat from the above-mentioned authorities, and to assign to the bicuspides and cuspidati the greatest liability to the condition. That it is more common to the teeth of the upper than to those of the lower jaw is the opinion of J. Tomes, and I believe of most who have described the affection.

With the exception of Fox and J. Tomes, none of the above speak of a termination to the process other than as becoming arrested when the part affected assumes a brown colour; nor do they allude to the almost invariable coincident of secondary dentine, which obliterates the pulp-cavity, and prevents exposure of the pulp. I believe it to be extremely rare for the pulp to be so exposed; when it is, it will be generally found that it has resulted from true caries having supervened upon the denudation process.

With regard to age, it is certainly an affection more common to middle life than to any other period. Hunter speaks of his two most interesting cases in individuals aged respectively twenty and forty. I should say that at about the intermediate period it is generally met with. If it occur in the milk set, it is certainly rare. I cannot say that I have never seen it, on the contrary, I believe I have; but what I have seen may have been only that superficial form of decay so common to the first teeth—and which might perhaps be well designated erosion—which has become arrested and polished by friction. In looking over a large collection of temporary teeth, I could not find a single instance of it, although the sharply defined line at the limit of the enamel, especially on the lingual surface of a molar, might, to a careless observer, lead to such an error.

Sex.—Any really careful observation I may have made, with respect to the affection, dates from so short a period that, if I venture to offer an opinion upon its relative frequency in the two sexes, it must be regarded as little other than a vaguely formed opinion, and if I express such, it is that I incline to the view that it is more frequently met with in females than in males; but my impressions on this head may have arisen from the fact that we see more female than male patients.

The appearances presented by the affection have been so well described by Hunter and other writers quoted, that, as before stated, there is no necessity for my recapitulating them; I could only wish it were as easy a matter to assign to it its true nature and cause. I have been able to make out but little that is really satisfactory to my own mind, still, as that may perhaps prove one step further in knowledge gained, I willingly, though diffidently, communicate it.

With regard to microscopic observations—and here let me state that without, for one moment, undervaluing that immense means for extending and confirming our knowledge of both physiology and pathology, yet the appearances presented by highly-magnified sections are so deceiving, that even the honest inquirer going to them with strong preconceived notions is very likely to make out with his eyes that which his heart longeth for. With regard to myself, however, I may say that what I might have expected to see that I could not make out, though it is very probable that what I may describe is not that which I actually did see.

Section 1, of which with three others I have given illustrations, together with the outlines of the teeth from which they were cut—and which must be regarded as decidedly diagrammatic rather than literally correct, as you will see when inspecting the originals under the microscope—is from an upper left central incisor kindly sent to me by Mr. Pearman, of Torquay, and is a well-marked specimen of the affection, but, as is not uncommonly the case, has suffered at an advanced stage from true caries as well.

This is shown in the upper part of the diagram, and which resembles an ordinary though not characteristic specimen of caries. The tubular structure approximating upon the carious surface is rather more conspicuous than in the healthy portions, and terminated in an undefined mass of yellowish broken-down structure, mixed up probably with micrococci. In the lower portion, and which is not affected with caries, a sharp clear edge is presented externally, whilst it will be remarked that the dentinal canals are of uneven calibre and present a beaded form, the contents being apparently very unevenly distributed throughout them.

Section 2 is taken from an upper cuspidatus of the left side. In this we see the same varicose and beaded condition of the tubuli as in No 1, but we see also, that which in the small number of sections I have been able to make is as often absent as present, that is, some appearance of the "zone of Tomes;" in no specimen have I found it so well marked as to be able to say that it was identical with it, and as the nature of this phenomenon, both as an evidence of antagonistic energy to disease, or a manifestation of disease itself, is disputed, I feel I shall gain little in insisting or otherwise on its appearance in the decay by denudation.

Section 3 I regard as a very interesting one, being a lower left cuspidatus, for a long while the only tooth in the mouth of an elderly gentleman whom I had under observation for several years. At the back of this tooth there rested a vulcanite plate, and its continual movements wore the tooth half through, the pulp-cavity, which is not quite obliterated, being protected only by a very thin wall of secondary dentine: besides the friction of the plate, which has kept the surface as highly polished as in almost any case of decay by denudation, I think we ought to add the softening action of particles of food which lodged upon the portion of the plate in contact with the tooth—I regret the section as cut shows too much of the transverse structure of the dentinal tubuli, but still I think it can be clearly seen that the dentine appears perfectly healthy, and is quite free from the characteristics of caries on the one hand, or the beaded condition of the denudation cases on the other hand.

Section 4 shows in a marked degree the beaded contents—or non-contents—of the dentinal tubuli. In some cases this is so marked as to prompt the suggestion that they may have undergone a fatty degeneration. I am well aware that such an appearance might be produced by other conditions, as the presence of air, or otherwise, in the interior of the tubuli; but, if so, it is difficult to account for its almost complete absence in the friction-produced specimen, No. 3. The section is obtained from a left lower cuspidatus, also kindly sent to me by Mr. Pearman, of Torquay, and is in more respects than one an interesting specimen; it is more or less coated with tartar upon all portions of the crown, and fang, excepting the external surface of the former and a special portion of the latter. The affected portion, at the neck, is well-marked, and might serve for a typical specimen of it. But that which is of chief interest is a small, scooped out, highly polished facet, continuous with, but below, the above-mentioned, and approximating upon its posterior or distal surface. I should have much liked to have seen this tooth *in situ*, but even the donor states "I have no history to give with them."

Section 5, which I have not illustrated by diagram, is from an upper right molar, most probably the first of that order. It presents the affection as a sharply defined notch at the neck, and chiefly above the posterior fang. It is this form which is so highly suggestive of the action of the tooth-brush, though found in those to whom, if this appliance be not unknown, its use is not familiar. It would, however, be interesting to ascertain whether it exists in those who do use, and in those who do not use, the tooth-brush, in the same proportion. The section possesses much the same charac-

teristics as those before described, only in this one are to be seen faint markings of interglobular spaces not met with in the others.

The conclusions I have arrived at, from what I must confess to be other than a deep investigation of the subject, are firstly, that the main element in the process is friction, but that the condition which permits the loss of substance thereby is favoured by a change or degeneracy in the tooth itself. We will consider these conditions in the reverse of the order above given.

My impressions, previous to commencing the present investigation in regard to the affection, were that it arose from the direct action of some solvent furnished by the labial glands, or those of other parts which were immediately adjacent to the wasted spots. The application of litmus to both these spots and the opposing glands or surfaces, however, has never, in a large number of cases, afforded any greater evidence of acidity or alkalinity than is to be found in normal saliva in its varying conditions. I am well aware that solvents of tooth structure might exist having neither of those reactions; indeed my own views in respect of dental caries point in such direction. But then one would naturally expect to find more or less accumulation of foreign matter at those places, whereas the teeth there appear more free from deposition than at any other portion of their exposed surfaces. Again, is it reasonable to suppose that a substance composed of such material as a mixture of gelatinous matter and lime salts should, when attacked by a solvent, unless accompanied with considerable friction, present a very hard and highly polished surface. I cannot avoid the conclusion, but that in the majority, at least of denudation cases, some degenerative changes have taken place in the tooth structure, and especially in that of the dentine, and which has the effect of rendering them less capable of resisting friction than when in a normal condition.

It would be pure speculation on my part to attempt to suggest how this might be brought about; but if I did so speculate, I might suggest whether, by a fatty degeneration of the contents of the dentinal tubuli, and the formation of a fatty acid, the surrounding phosphates of calcium might be influenced; or, from another point of view, which embraces ideas which are more and more growing out of favour, as being less in accordance with facts elicited by modern research, it might result from a lessening of that power of resistance vaguely termed vital force, which has been supposed capable of protecting the bodies it pervades from chemical and physical influences.

A fact of no small significance in relation to this subject is the relative liability in certain teeth to be worn away, or otherwise, under almost precisely the same conditions—viz., such as food, age, habits of life, &c. Amongst a class of people who reside in a country where a large proportion of grit finds its way into their food, as in the case of the Bedouin Arabs for instance, we shall find the teeth almost invariably much worn on the masticating surfaces; but yet the differences in degree are so marked as to lead irresistibly to the conclusion that some teeth resist this attrition better than others. If we were to take a large number of individuals living in this country under precisely similar conditions, I more than predict that we should find considerable differences in the degree to which their teeth had resisted the friction of mastication. All of us must have been at times struck with the apparent wear of teeth at spots and places where, if from friction, it could only have been that from the tongue or the larger fragments of food. Here are casts illustrating this point, kindly furnished to me by an intelligent pupil, Mr. C. E. Truman. It is clear, I think, that the portion of the surface of the molar marked could never have met an opposing tooth. But the most marked case of this kind which ever came under my notice occurred in the person of a clergyman, for whom I constructed a denture, supplying the six front teeth, and, I believe, also all the bicuspids of the upper jaw. The teeth whose places

were supplied were all so perfectly level with the gum that there was no necessity, I well remember, for any employment of the file or other appliance for reducing their surfaces. The bite was certainly an edge to edge one; but the individual could not have been past forty. I much regret that I parted with the model of this interesting case. There was nothing in his history to account for this unusual wearing away of the teeth, and I think we can only conclude that his teeth, and the teeth of like condition, must be, in certain respects, different from those in other persons.

With regard to the agency by which the friction is, in all cases, furnished, I shall, in accounting for it, as you will surmise, encounter some difficulty. This, however, to my own mind, has gradually lessened as my investigations have progressed. With regard to how furnished, this, I think, may be speedily disposed of by the recognition of the act that all the movable soft structures of the mouth—but the tongue especially—are capable of reducing in dimensions the dental structures. We well know how soon a sharp edge of enamel is reduced by the movements of the tongue; the latter suffers in the contest, but finally prevails, in consequence of its powers of repair. This upper model shows how a tooth may suffer from the constant rubbing of a thumb, in the evidently gratifying process of thumb-sucking; between cause and effect in this instance not a shadow of doubt exists. An indirect point in this case is that the individual of whom this cast is the representative, and who is a child of eight years and a half old, has, as it will be observed, all her lateral incisors wanting, and hence it may also happen that the incisors she possesses may be more or less abnormally imperfect in development; also, it may occur that the degenerative changes that induced the affection may be similar changes to those which occur in the temporary teeth prior to their absorption. The teeth, the fangs of which present a horny appearance—*i.e.*, where the tubular appearance is obliterated—are, we know, peculiarly subject to absorption; and most of the teeth affected by denudation which I have examined, present more or less the horny character, some in a considerable degree.

An intelligent friend, if, indeed, I can call the individual "friend," who chiefly persuaded me to commit myself to this paper, but who, as a careful observer, is entitled to much consideration, informs me that he believes he never witnessed the process in a necrosed tooth. I am sorry I can neither oppose nor confirm Mr. Campion in this view, although I rather incline to his opinion. In some of the specimens before you the teeth were most probably dead at the time of their removal, but the process may have existed only at the time they possessed vitality. If such be the case, I think it rather tends to support the view of there being a degenerative change in the contents of the dentinal tubuli affecting the surrounding dentine, and which, ceasing with the death of the tooth, the process is arrested. A condition not much dwelt upon by writers upon the subject is the great sensitiveness presented at the denuded spots, especially in the earliest stages; when touched by the finger-nail, or hairs of the tooth-brush, they give a sharp and peculiar thrill, with a sensation like cold along the region of the spine. A tooth under such conditions cannot be devoid of vitality. Another point, also bearing on this opinion, may be mentioned, and it is the only one I will offer with regard to treatment; for though I believe the plan will invariably, if persevered in, prove successful in arresting the affection, and causing it to assume the brown colour mentioned by the earlier observers as the evidence of its cessation, it is of too empirical a nature to come under the head of a rational treatment. It is the constant local application of ammonia or one of its compounds. I usually recommend sal volatile—as being of a suitable strength—to be applied on a little cotton, or brush, three or four times in the day. If, as suggested, a softened condition in the dentine exists, and if this be brought about by an acid condition of the contents of the dentinal tubuli, then a limpid

alkali, and such an one as can penetrate the tubuli, would be the most likely to counteract the condition.

To return to the question of friction—and here I feel I must differ from those who point to its existence—I mean the affection as clearly described by Hunter—in places inaccessible to any agent capable of rubbing or touching the same. I believe I have never seen a case in which it was not possible for friction, either by tooth-brush, tooth-pick, tongue, lips, or saliva, to have been applied. With regard to the last-named, my friend Mr. Todd has reminded me of the familiar instances of the stone worn by the continual dropping of water, and the pebble rounded in the brook; as also of the fact that all the pebble ornaments, pen handles, &c., produced so cheaply in Germany, are polished under water. In my own mouth are some well-marked cases of the affection, but from their dried surfaces my tongue and lips can at once remove any pigment applied to them. In respect of those cases which present fine saw, cut-like markings on their approximal surfaces—molars especially—near to the gum, they could certainly most readily have been produced by some hard pointed instrument, continuously applied in the same direction, with the object of pressing food from the buccal to the lingual orifice of the space existing at the necks of such teeth when the gum has receded. Were such markings found amongst the teeth of the lower animals, I should then at once withdraw a tooth-pick origin to account for them; but what does exist, so far as I have been able to ascertain, of an approach to this affection amongst the lower animals, I will now endeavour to describe.

Through the kindness of Mr. C. S. Tomes, my attention was directed to the peculiar markings on the tusk of the female Indian elephants, "Specimen—2769A in the Museum of the Royal College of Surgeons." A history attached to these or similar specimens will be found in the Transactions of the Zoological Society for the year 1871, p. 145. The elephants bearing these tusks were shot in Ceylon by Mr. Sclater, and at the time he remarked the peculiar and unusual markings upon them; also a mass of egg-like bodies, arranged in regular series, of apparently some dipterous insect, somewhat resembling those of the common blow-fly. On examination of the grooves at the gum no maggots were discovered. The subject has, I believe, been further investigated by Dr. Spencer Cobbold, and discussed at the Linnæan Society, but I have not been able to find any paper on the subject in its Transactions. Being unable to ascertain at the College of Surgeons how much of such tooth would be exposed above the gum, I visited the gardens of the Zoological Society, and there inspected the mouth of a female Indian elephant, which showed that all the grooved portion was situated below the gum, and the smooth portion above. The affection, therefore, as shown in one of the casts I was kindly permitted by Professor Flower to take, was probably, at least some portion of it, below the level of the gum, and had, I should apprehend, undergone absorption, from either some altered condition of, or secretion from, that structure or the alveolo-dental membrane;* but how far this might be due to the presence of the parasites, or the parasites owe their existence to it from the presence of some unhealthy secretion, is a matter upon which I will not venture to offer an opinion. I think I may, however, remark that the conditions presented by these elephants' tusks resemble but very slightly, if they do at all, the condition of decay by denudation as witnessed in man; nor, on the other hand, do they resemble ordinary dental caries. With regard, however, to the teeth of a certain class of seals, the otaria jubata (sea-lion, or fur seal) the case is different; here we have, judging from external appearances only, a condition similar to, or approaching, that seen

* Dr. Murie, *op. cit.*, remarks that it is "a case where, more truly, erosion from periosteal inflammation is indicated."

in the human species. With respect to this condition, Dr. Murie, in the paper before referred to, remarks: "To my mind, neither the supposition of inherent disease, nor simple friction, of a certainty accounts for the uncommon manner in which the otary's teeth have lost substance." It is possible, he admits, for the dental apparatus to be worn away by, or denuded of, the softer dentine by the unequally fitting and rubbing of the teeth against each other; but in the case of the otaria he believes this impossible; "for the abraded surfaces are not those which meet in mastication or closure of the mouth." My conclusions in this respect, however, somewhat differ from Dr. Murie's. The immensely broad condyles of the lower jaw show a great capacity for lateral movement, and such as would, in the recent state, almost permit the rotation of the lower around the upper cuspidati, and I think there can be no doubt but that much of the loss of these teeth, at least, is due to antagonistic friction. It is also a fact, as pointed out by Dr. Murie, "that seals—notably the species under consideration—swallow mouthfuls of pebbles." . . . "Now granules of sand may be taken up at the same time, and effect an erosion equivalent to an injurious dentifrice," but he considers the staining, regular circular abrasion, nature of the polish, and the mode in which particularly the great canines are reduced, oppose rather than support mechanical friction alone as the agent at work. He does not believe it can be due to absorption, nor does he see his way clear for accepting inherent disease of the tooth-substance as a cogent reason for the removal of the tissue. "By a combination of them, however, the resultant wearage is more likely to have been brought about." He suggests "an inherent constitutional tendency for the teeth to be acted on by external agency." . . . . "An altered or unhealthy condition of the glandular fluids," in which "the lips, gums, and tongue would play a vital part." . . . . "Add to this the mechanical influence of fine particles of sand, grit, &c." He neither explains nor contradicts the assertion that certain cases of notching and erosion may be due to purely mechanical agencies; indeed, he states his belief that such instances do occur; at the same time he is none the less convinced that examples, both in men and animals (the otary to wit) show that dental loss happens through processes other than friction *per se*.

I am, I confess, at a loss to explain this condition, as occurring in the seal, by any reference to a degeneracy in dental structure, such as we can justly assign to a being like man in the civilized condition, and in whom we should almost expect to find organs so imperfectly employed as are his teeth in a state of degeneracy. And in his case, with regard to the question of abnormal friction, surely the fact of man's being endowed with speech must be taken into account. Speak but for a short time with your attention directed to the rapidly continuous movements of the lips and tongue, and then consider what that friction under water must amount to in but one year. It is an interesting fact, that of all animals, the sounds which can be made by the seal most nearly, I believe, resemble the human voice, so that it has often been called "the talking fish." Its tongue is long and free, and although it appears to swallow its food with but little mastication, the tongue, though I have not been able to verify in my examination of the seals —which are not the furred variety—at the Zoological Society's Gardens, may be well employed in removing the scales of fish which no doubt at times adhere to the teeth with some pertinacity. It is such a tongue as can well sweeep round its cuspidati, premolars, and molars, which have considerable distances between them.

When speaking of the affection as being more common to the female than to the male sex, I trust my hearers will freely acquit me of having, at the time, this suggested agency for it in mind, an agency which, if it have a true existence, must be regarded as another element in our civilization tending to bring the *genus homo* to an edentulous condition.

When I look round upon this assembly and this Congress, numbering so many dis-

tinguished individuals, and from such varied countries, a temptation arises which it is difficult to resist.

I can conceive of no grander opportunities than are those afforded by these International Medical Congresses, for the general acquiescence in, and settlement of, a universal nomenclature of the diseases which are common to the countries represented; and if I may be so bold as to make a suggestion, it is to the fact, that this International assembly, of dental physicians and surgeons, do herewith decide upon the designation which, in their opinion, may best describe the affection first noticed by Hunter and by him named "The Decay by Denudation."

DISCUSSION.

Mr. Gaddes, London: mentioned a case in which this condition of erosion existed in a right-handed gentleman. The disease was only very slightly marked on the left side of the mouth, but very deep grooves from erosion prevailed in the upper and lower canines, biscupids, and molars of the right side, just where the friction from the tooth-brush would not be expected to be in greater amount, neither did the patient consider he brushed the teeth on the right side more than those on the left. The cavities were very sensitive to the excavator.

Dr. J. Taft, Cincinnati: This is one of the most obscure affections of the teeth with which we have to contend. There are a number of presentations of this affection; it sometimes presents a plain level smooth surface, wearing away the end or masticating surface, uniformly leaving the enamel slightly more prominent than the dentine. In other cases, cup-shaped cavities, varying in size, are formed; these, also, are upon the masticating surfaces of the teeth. Upon the labial and buccal surfaces, this process is frequently shown in the form of plain surface cutting, or in transverse grooves, varying in superficial extent and depth. Many of these cavities and grooves are so found and situated, that mechanical attention fails wholly to account for the process. How much this affection is dependent upon any peculiar condition, either accidental or original, in the tooth structure, is a problem yet to be solved.

Mr. Magor, Penzance: I meet with a great many cases of erosion of the labial surfaces of the teeth, but I do not find those surfaces polished, excepting where the teeth were habitually cleaned. I meet with other cases where the grinding surfaces are much worn away by chewing tobacco, such as in the case of sailors and fishermen; and perhaps I may be allowed to instance one particular case, that of a Newlyn fisherman, who, when first I examined his mouth, had his full complement of thirty-two teeth, all worn down almost level with the gums, right into the pulp cavities, which latter were filled up with secondary dentine. Another singular case lately came under my observation, in this patient the cutting edges of the two upper central incisors were worn away as if filed and polished, so that there was a considerable space between the upper and lower incisors when the mouth was closed. This is a case which seems to me very difficult to account for, but I should like to hear some explanation of it.

Dr. Dentz, Utrecht: I wish to state, that the opinion emitted by M. Magitôt, in the Section of Diseases of Children, with regard to the nomenclature of erosion, denudation, &c., does *not* express the opinion of the Continental professional men as Mr. Coleman thought. We have mostly studied English works, or their German translations (Germany and Holland), so are generally guided by our English and American colleagues in our terminology.

Mr. C. S. Tomes, London: I believe that the view entertained in France is, that erosion is merely caries, rapidly and completely worn away in fact, as it softened "carie sèche," and there is the difficulty of accounting for waste of the cutting edges of teeth sometimes observed. The effect of friction is well illustrated by the difference of loss of material on its two sides, which can hardly be otherwise accounted for than by the friction of the tooth-brush.

Mr. Coleman, in reply, said: that in having to read his paper in abstract he had not been able to do justice to his subject, and still less to his audience, as several of the queries propounded by the latter would be found answered in the former. He was glad to hear from Dr. Dentz, that Hunter's term for the affection was more generally applied to it, on the Continent, than he had supposed. To Mr. C. S. Tomes he was grateful for the complimentary manner in which he had spoken of that portion of his paper which accounted for friction in the case of man and the seal. He could not agree with M. Magitôt that this affection was but a variety of caries—"carie sèche"—but as he had no opportunity for examining microscopically a recent specimen—one that could be stained—he expressed his opinion with some diffidence. The views expressed by the Chairman and Mr. Gaddes, and which received confirmation at the hands of the Messrs. Tomes, were much in accordance with his own. Dr. Taft, in no uncomplimentary terms, had expressed dissatisfaction that nothing tangible had come before the meeting with regard to the subject; he could only say that that disappointment was equally shared by himself, but he still trusted that, by further attention to, and a more thorough investigation of, the subject, he might be enabled to produce, on a future occasion, something more worthy the attention of an International Congress.

Experiments on the Action of some Agents used for the Devitalization of the Tooth-pulp.

Dr. Joseph Arkövy, Buda-Pesth.

The devitalization of the pulp being a daily occurrence in dental practice, it is necessary for the practitioner to be quite clear even about the minute effects of this sort of treatment.

A considerable number of papers on the subject may be found scattered in the periodicals, but the manuals of dental surgery only contain general remarks upon it. We search in vain in the empirical descriptions for an account of the pathological alterations produced by devitalizing agents, as well as for directions for their use, founded on a scientific basis. Perhaps the sole, and certainly the largest, monograph which has been written on the subject, is by Dr. A. Combe,* of Paris; but although attention is there directed to the mode of application of arsenious acid, the patho-histological details have not been made a subject of special inquiry.

These circumstances led me to commence a series of experiments on dogs, in order to elucidate, if possible, all the dubious questions which surround this subject.

Before giving an account of my experiments, we should consider the agents on the scale of the value of their applicability. I think, that every practitioner will agree with me in stating, that the ideal requirements to be expected of any pulp-devitalizing agent

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* Anthelme Combe, "De l'Acide Arsénieux dans ses Applications à la Thérapeutique de la Carie Dentaire," Paris, 1879, translat. *Brit. Journ. of Dent. Science*, vol. xxiii. No. 297, and subsequent numbers, 1880.

are—the easy application, sure, and if possible quick action, the least possible causation of pain, and no interference with the hard substances of the tooth. Now, we find only two agents which answer these expectations; arsenious acid and pepsinum.

It is rather curious, that both agents are, especially the former, hardly known as to their effects upon the elements of the organism; and the investigations made in that direction (excluding the pretty old practical observations) are of the newest date. We will take a glance into them as far as they are serviceable to our subject. In 1879 Binz and Schultz* made experiments with arsenic from a chemical standpoint, the results of which show that, incorporated into the organism, arsenious acid changes into arsenic acid and *vice versâ;* both changes are executed by the protoplasmic tissue, and arise from the oscillation of oxygen atoms of the albumin-molecules; the quantity of these atoms deciding as to the therapeutic or toxic action of arsenic. Under the influence of protoplasmic tissue a certain quantity of active oxygen becomes untied, and that is the real poison producing gangrenous destruction. That the arsenious acid has a special action upon the nerve centres is a well-known supposition; and we may add, after Ringer and Murrell's† experiments, that its action paralyzes the conducting power of nerves quicker than it stops the function of muscles. Another not improbable statement is, that arsenious acid undergoes a chemical combination with hæmoglobin, as is shown by the spectrum, where we see only one of two oxyhæmoglobin lines.

Pepsinum has not until now been used much for devitalizing purposes, and has been limited to internal treatment. Once it has been mentioned for this purpose in one of the English dental journals—I cannot tell which and when—but it was not much adopted. Its action and the alterations produced by it in the tooth-pulp have not, as yet, been inquired into.

The experiments, which I now intend to communicate, bring, I believe, some light into the patho-histological details of the subject, and so, I think, they will be of interest for the profession.

There are questions which cannot escape the attention of a thinking dentist while applying devitalizing agents. The first of all is, the correct quantity to be used; the second is, what are the minute changes the pulp will undergo? a third question is, whether there is any chance of mischief possibly imposed by such an agent upon the dentine, enamel and cement? fourthly, in what light must we look upon consecutive periodontitis?

I have made experiments with arsenious acid as well as with pepsinum, in order to see the difference of their action, and so be able to state which might be the indications for one or the other. The experiments have been executed in the pharmacological institution of the University of Buda-Pesth, on three dogs. The *modus operandi* was the following:—

I had an apparatus made for the fixation of the dog's head, the construction of which consists of a central iron ring divided into two portions, and provided with two screws and small leather-cushions to it, so as to keep the dog's nozzle fast, one serving to screw in the upper, the other the lower jaw. From the segment of the circle of the ring there are two branches extending to the maxillary articulation, so that, provided with iron joints, it may imitate the movements of the real jaw, and make it possible that by screwing

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* Experimenteller Beitrag zum Verständniss der Arsenwirkung von Binz und Schultz *Centralblatt für medicinische Wissenschaften*, 1879, p. 17; and Die Arsengiftwirkungen vom chemischen Standpunkt betrachtet: *Archiv. f. experim. Pathol. u. Pharmacol.* ix. 200.

† S. Ringer and W. Murrell: The Action of Arseniate of Soda and Arsenious Acid on Frogs: *Journ. of Physiology*, i. p. 213.

Tooth.	Milligramm. As_2O_3	Milligramm. Pepsinum.	External Examination: Part of the Tooth at the— Drill-hole.	Crown.	Root.	Microscopical Examination: Part of the Tooth-Pulp at the— Drill-hole.	Crown-pulp.	Root-pulp.	Special Remarks.
Left upper incisor. I. and II. (A.)		...	No alteration in dentine and enamel, either on long or cross sections.	...	Apical one-third of peri-dental membrane slightly injected.	No special destruction; nerve fibres normal; the blood-corpuscles in the blood-vessels are to a certain extent a granular detritus.	Diffuse blood pigmentation.	At the apical part moderate blood extravasations, which seem to be caused by capillary embolisms, as seen in several instances (see Fig. 1). Hartnack, oc. 2, obj. 8.	—
Right upper incisor. I. and II. (B.)		1	Pinkish brown.	Pinkish hue.	Apical two-thirds normal.	Resembling clotted albumen close to the drill-hole, while on the opposite side even the layer of odontoblasts intact.	...	No embolisms.	The I. incisor differs from the II., inasmuch as here the apical end of the root-pulp is injected, while it is quite pale at the drill-hole. In general the pulp in this instance seems to be less affected than in the former case.
Experiment (on June 6) Black Dog, 3 Years Old.									
Right upper canine. (C.)			Normal.	Brownish red (pulp).	Apical one-fourth of root-pulp brownish red	...	...	The dentinal tubes show no change whatever; but the fibrils in several instances seem to be in a state of granular tumefaction at the tinged apical portion.	Sections of the pulp put upon a china dish, and held over the spirit-flame, leave a dark black dust (characteristic of arsen.), while pulp-particles (normal) become in the same process only dry and brown.
Right upper incisor. III. (D.)			Normal.	Slightly reddened dentine.	Brightly, reddened dentine and cementum.	Immediately under the drill-hole, cells of connective tissue enlarged; intumescence of the nuclei of neurilemma; in the axial part of nerves the axis-cylinders almost disappeared, and in some places replaced by granular contents. Blood-vessels normal, rather anæmic.	Apical one-third; blood-vessels telangiectatic; one-fourth to one-sixth of their normal size.	...	The whole pulp-tissue in general is scattered with arsen. molecules. It is a very remarkable circumstance, that while pulp-tissue *in toto* is suffused by blood pigment, the blood-corpuscles in the interior of the vessels are bereft of their pigment, and so point to the suggestion that the arsen. molecules form a chemical combination with the hæmoglobin of the blood-corpuscles.

Left upper canine. E.	...	4	Hard substances show no alteration; pulp in general considerably injected, especially the upper three-fourths; hence, to the apex no change at all.			Granular detritus and considerable destruction, where micrococci may be seen (probably from the agent itself); dentine not changed.	...	At the demarcational line the blood-vessels expanded to four or five times the normal size; however, the blood-corpuscles did not lose their pigment; on the contrary, where they are crowded, they form purple spots. Under the demarcational line the vessels are bloodless and shrunken.	At the last one-fourth of the root-pulp a demarcational line is to be seen, consisting of black-looking, clotted blood, running all round the body of it; the pulp is, under that line, collapsed, and does not fill up the root-canal. In the whole pulp the nerve-fibres exhibit no alteration.
Left upper incisor. III. F.	...	4	Alteration confined to one-fourth in its middle; dark red; injected.	Upper, and, to a certain extent, also at the lower end of that part a demarcational line.		Blood-vessels expanded, and full of their contents; pepsin molecules spread over it.	...	...	Some of the capillaries at the affected part contain in excess pepsine grains, and only very few blood-corpuscles (Fig. 2, obj. 8, oc. 2).
				Proper crown pulp unaltered.	Ditto.				
Left upper molar. I. G.	5	...	...	In the pulp chamber 1·2 mgrmm. of excess of arsen.	Peridental membrane considerably injected on two of the roots; one is specially affected, and even the dentine and cement is brownish-red from the drill-hole to the apex. No normal part on the whole tooth.	Dentine seems to be normal; arsen. particles not able to invade the tubes; fibrils unaltered. Pulp tissue: enlarged cells, blood-corpuscles pale (as above).	Hardly any change; only in a few capillaries blood-corpuscles in detritus.	Three millimetres under the drill-hole, and especially at the apical end, ecchymosis in high degree. The vessels contain arsen-molecules, and are partly collapsed (Fig. 3, oc. 4. obj. 8). Some of the vessels form an exception. Immediately under the drill-hole the protoplasm, as well as the nuclei of the connective-tissue cells, are remarkably enlarged, about three to four times the normal size (Fig. 4, oc. 4. obj. 8).	In general, in this specimen the blood-corpuscles are disintegrated into granular detritus; and we get the impression that such masses produce embolism, and not organized thrombosis; and hence the plugging of the apical vessels. The myelin of the nerve-fibres is granular (Fig. 5, oc. 4. obj. 8). In other places the nuclei of the neurilemma are enlarged. The granulation does not look like fatty degeneration. These changes occur mixed with integral tissue. It is curious and highly interesting that, in the least affected and most peripheral crown-pulp, we find some nerve-fibres with single and double contour, where the axis-cylinder exhibits notches of oval shape. They are sometimes close, and sometimes at some distance from one another. These are to be looked upon as tumefactions of the axis-cylinder. Yet it is singular that the neurilemma does not proportionately expand, answering to the enlargement of the tumefied parts (Fig. 6, oc. 4. obj. 8.)

EXPERIMENT (on May 29) YELLOWISH-BROWN DOG, ABOUT 3½ YEARS OLD.

Tooth	Milligramm. As_2O_3	Milligramm. Pepsinum	External Examination: Part of the Tooth at the— Drill-hole.	Crown.	Root.	Microscopical Examination. Part of the Tooth-Pulp at the— Drill-hole.	Crown-pulp.	Root-pulp.	Special Remarks.
Right upper molar. II. H.	...	5	Two-thirds in the middle of the pulp collapsed; brownish red, brittle.	Pulp slightly injected; dentine close to the pulp moderately pigmented.	Peridental membrane moderately injected; apical one-third; slightly altered.	Hyperæmia; blood-vessels extraordinarily dark red. The periphery of the pulp is totally destroyed, resembling coagulated albumen, while its axial part did not much suffer.	Much detritus; here and there unaltered tissue.	The upper part presents an aspect of almost total destruction, with detritus and in the greater blood-vessels crowds of fatty-molecules may be observed. (Fig. 7, oc. 2 obj. 8.) In general the whole axial part of the root-pulp is in a state of congulation and fatty detritus; nerve-fibres partake in the latter. The peripherical part of the root-pulp hardly underwent any change	The dark red colour (the contrary of which we find in specimens treated with arsenic) insinuates the supposition that pepsinum removes chemically the water of the blood-corpuscles, and only the blood pigments remain in the vessels.
EXPERIMENT (on 3 July) BLACK DOG, 11 YEARS OLD. (Agents not in direct contact with the pulp, but only separated by a thin lamella of dentine Section. After three days).									
Right upper incisor. III.	1	...	No change whatever.				...	...	...
Right upper canine.	5	...	Slight injection.	Considerably injected.	No change.	Dentinal tubes; diameter greater.	Great quantity of fat globules scattered throughout the right top of the crown-pulp.	No alteration.	The animal having been very young, the greater diameter of the dentinal tubes is to be ascribed to that circumstance; at the same time, this seems to give also an explanation of the real cause of the injection. An additional cause of this may be the irritation of the foreign body and the drill-hole. The fatty aspect of the crown-pulp is not accompanied with any noteworthy trace of real fatty degeneration, either of the nerves or of the blood vessels.
Left upper incisor. III.	...	1	...	...	...	...	...	...	...
Left upper canine.	...	5	...	Vehement injection.	...	Vehement injection; blood-vessels expanded; no other change.		...	...

An additional experiment has been made with dentine—taken from the three-year old dog—which has been put in one watchglass full of soft water and five milligrammes of arsen. trioxyd.; and the same has been tried with the same quantity of pepsinum. After three days the microscopical examination showed the following: In the first instance (As_2O_3) neither the intertubular substance nor the tubuli underwent any change; not so the dentinal fibrils, which exhibited (Hartnack's ocul. 4, obj. 8.)—in a few places—longitudinal notches or tumefactions, as may be seen in the adjoining drawing (Fig. 8, oc. 4, obj. 8). The specimens in the solution of pepsinum I have found to be devoid of fibrils; but there was a noteworthy fact—viz., the preparation was covered by a great number of mycelium-threads and innumerable very light grains, probably spores of the fungi.

open and closing a separate fixed screw on one side, shutting up at the other, not only the head of the dog will be fixed, but also all desirable dilatation of the mouth will be executable, without permitting the least contrary movement of the animal. To promote this object the dog receives a sub-cutaneous injection of three and a half cubic centimetres of tinct. opii. simpl.

In general, I used the trephines with an old White's engine to pierce through the sound enamel and dentine of the teeth—mostly the canines, third incisors and first molars, and always at the gingival margin. When the hole was sufficiently large, the thin dentin-layer was drilled out too, and either arsenious acid or pepsinum suspended on a few wet threads of cotton-wool, twisted round a pointed instrument, was brought into contact with the surface of the tooth-pulp. After this, the cavity was stopped with Hill's stopping, and this was again washed with chloroform in order to prevent any escape of the agent and intrusion of saliva.

All this was executed with the greatest accuracy. The quantity of each agent was correctly weighed in advance, the smallest amount having been one milligramme, the greatest not exceeding five milligrammes. The arsenious acid I used was of the porcelain quality, and powdered; the pepsinum was the best German preparation. These agents remained for from twenty-four to twenty-six hours in the teeth.

In one instance—viz., in the experiment with the third dog, I inquired into the effect of these agents, without bringing them into direct contact with the pulp. Here only a thin lamella of dentin was left to occlude the pulp-chamber, just so thin as to let the red translucent pulp be seen. At the lapse of the above-named time the dogs were killed by prussic acid (acidum hydrocyanicum) and the teeth which had been operated upon were cut out, together with their bony connections, the agent was at once taken out of the cavities, and they were then put into a solution of alcohol, water, and glycerine (2 : 1 : 2) in order that the preparations might not change even in colour.

The statements resulting from the naked eye and microscopical examinations are put down in the foregoing columns. (Pp. 490–492.)

Now, if we gather and confront the facts which are contained in the above columns, we may get, I believe, some valuable account of the mode of action of these agents.

The first change which we see is the more or less injected state of the pulp; the former in specimens treated with As_2O_3, the latter with pepsinum. The injection of the apical end of the root-pulp, as a sign of inflammation or affection in general, is specially apt to follow action of As_2O_3, while that of pepsinum does not go so far, except when the greatest quantity (5 mgrm.) is applied, and even then the effect is rather molecular detritus and collapse of tissue. The injection in the two instances, arises from different causes; in the arsenious acid case we see capillary emboli at the apical root-pulp—and that is even produced by 1 mgrm. of As_2O_3—and consequent plugging of blood-vessels; farther on we see that a surprising change takes place in the blood-corpuscles—viz., they become very pale or quite discoloured, owing to the special action of As_2O_3 on blood in general—as quoted in the introductory remarks—which probably consists in a chemical combination of it with hæmoglobin. We see the contrary with pepsinum; the blood-corpuscles in the vessels do not diffuse their pigment into the tissue, and are darker red than normal; this, again, may be ascribed to the hygroscopic nature of pepsinum, in consequence of which the water is drawn out, and the hæmatin and hæmoglobin remaining, exhibit their more intense colour. So, in both instances, the action of the agents is directly upon the blood, and must naturally interfere with the circulation and nutrition of the pulp. Another proof that As_2O_3, incorporated into the pulp remains there either in form of As_2O_3 or H_3AsO_4, is that thin sections of such a pulp exhibit on a china disc, held over a flame, the characteristic black soot; and the conclu-

sion to be taken therefrom is, that in a longer space of time its action would extend over the limit aimed at. Arsenious acid has a special action on the tissue as well, inasmuch as it enlarges the cells of connective tissue (Fig. 4.) considerably (3—4 times), and while it acts in the same way upon the nuclei of the neurilemma, the myelin becomes granular. There still remains a question, however, as to the mode of action of arsen.-trioxyd. on the nerve fibres, as to whether we may ascribe this and the more surprising alteration, which I shall later remark upon, to the primary lesion in general imposed upon the pulp. Whatever opinion we may form on this matter, it is a fact that, beginning from 3—5 mgrms., a certain number of nerve fibres become granular in their interior (Fig. 5). The same action can be observed on blood-vessels, in specimens treated with from 3—5 mgrms.; their contents are granular detritus and the vessels are, to a large extent, collapsed (Fig. 3).

Fig. 20.*

ACTION OF DEVITALIZING AGENTS ON THE STRUCTURES OF THE TOOTH PULP.

FIG. A.—A pulp acted on by pepsin with a demarcational line (macroscopic.)
FIGS. 2, 7.—Blood-vessels from a pulp treated with pepsin.
FIGS. 1, 3.—Blood-vessels from a pulp treated with As_2O_3.
FIGS. 5, 6.—Nerve fibres from a similar pulp.
FIG. 4.—Enlarged connective-tissue corpuscles action of As_2O_3.
FIG. 8.—Dentinal fibrils slightly tumified by the action of As_2O_3 (see note p. 56.)

Pepsinum even in small, and specially in greater, doses (3—4—5 mgrms.), has a singular mode of action, as it produces a more or less defined demarcational line, leaving the end of the pulp really unchanged (Fig. A); and this circumstance may be of value in the discernment of the quantity which should be applied. As opposed to arsenious acid it is remarkable that the latter, in no instance, produces demarcation; and while we see every point of the action of pepsinum in changing blood, in forming a demarcational line and in producing—and that is the essential of its action—a kind of fatty degeneration in capillaries and larger blood-vessels (Figs. 2 and 7), as well as changing the living into coagulated albumen, the action of arsenious acid is not so

striking at the first glance; inasmuch as the destruction of the tissue is not so plain but is more extensive. Another question we wanted to have lighted up, concerned the periodontium. In that respect, I think, nothing will be more significant in deciding as to the degree of affection than the condition of the apical end of the root-pulp. In every case in which this point remained entire or unchanged, there will be no probability of the action having extended to the peridental membrane. We have practical reason to avoid the latter, and yet to desire that the action of the agent should include that end point of the pulp. Our agents act in a totally different way in that respect; and while we see a very slight injection already in the first (*A*) case after 1 mgrm. of As_2O_3 and see the same repeated in the following (*D*, *G*) cases in ascending degrees, we cannot find the action to this extent in the pepsinum cases, where the peridental membrane exhibited no alteration until after the application of 5 mgrm. (*H*.) In the arsenious acid cases we find, in every instance, a certain degree of affection of the last (apical) one-third or one-fourth of the pulp. On the contrary, in the pepsin cases this part always remained unaltered, with the exception of the last (*H*) case. Now, the conclusion will thus be obvious that As_2O_3 is more liable to produce periodontitis than pepsinum. Still, a certain part of the value of that statement remains an open question—viz., whether the apical part of the root-pulp will still be made insensible if left unaltered, and beyond the demarcational line. I believe that the quick progress of fatty degeneration, which invades the nerve-fibres, gives support to the proposition, that the sensibility is at least degraded. On the other hand, As_2O_3 gives evidence that its action very quickly reaches the peridental membrane. This latter question has found different explanations. Dr. Cruet (as quoted by Combe, *op. cit.* p. 50), ascribes the periodontitis, in such cases, to the increase of collateral circulation, produced by the suppression of the same in the interior of the pulp. Dr. Combe, in his own opinion, rather attributes this effect to the influence of arsenic in general. On the ground of our introductory remarks, this inflammation must be due to *chemical changes* produced by arsen. trioxyd. in the elements of blood and protoplasmic tissue in general, and for this affection we shall find evidences also in our columns, from which we learn, that particles of As_2O_3 are taken up into the blood-vessels (Fig. 3), and carried towards the apex, &c.

The consequences produced by arsen. trioxyd. if left lor a longer space of time within the pulp, may, on that account, be considered as critical for the existence of the tooth as well as for the health of the socket, and even the body of the maxillary bone. Therefore, the total extirpation of the pulp, after such an application, must in due time be considered as absolutely essential.

Now, if we again direct our attention to the patho-histological changes of the nerve-elements, there we find a most singular alteration of the axis-cylinder (*G*). This consisted in the notchy tumefaction of the axis-cylinder. The notches were partly close, and again at some distance from one another; they were dark, and looked to be of homogeneous matter—not granular. The neurilemma was not proportionately widened, to correspond with the notches. How was this to be interpreted? I soon found that patho-histological fact mentioned in Professor Charcot's "Leçons sur les Maladies du Système nerveux."* Charcot, and before him a few authors, have observed that tumefaction of the axis-cylinder. Heinrich Müller was the first to recognize this in the fibres of the retina, associated with fatty degeneration of the connective tissue and blood-vessels, in cases of nephritis albuminosa (*Arch. f. Ophthalmologie*, iv.). Afterwards

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Tome ii. 3me éd. Paris, 1880. Appendice iii. "Sur la tuméfaction des cellules nerveuses motrices, et des cylindres d'axe des tubes nerveux dans certains cas de myélite."

Zenker, Virchow, Schweitzer, Nagel, and Hadlich had occasion to describe similar observations, and Charcot, of his own account, in cases of myelitis. All the cases which have been published on the subject are limited to diseases and traumatic conditions of the brain and spinal cord; the only one exception being the retina. This circumstance seems to me to attribute to these observations a certain importance, inasmuch as the same patho-histological alteration in our case is stated to exist also at the most peripheral point of the tract of one nerve—viz., that of the tooth-pulp.

Whatever the right significance of this affection of the axis-cylinder may be—this being to-day an open question—we can only consider it as an inexplicable fact, and an essential alteration in the texture and physiological function of the nerve fibres, which may be looked upon as a primary change, caused by the foreign body, either mechanically or by its chemical action.

Result of the Experiments.

Theoretical Part.

Arsenious Acid.—I. As_2O_3 brought into contact with the tooth-pulp acts in the following way: a certain degree of inflammatory hyperæmia, total or partial, depending upon the quantity of the agent applied, sets in; the blood-vessels become expanded (3—4 times), of regular diameter, and here have a tendency to thrombosis. This latter effect may also be in connection with embolism of the capillaries, when the agent is quickly taken up into the blood-vessels.

II. As_2O_3 produces no coagulation of tissue whatever.

III. It has a specific influence upon the blood corpuscles, combining with the hæmoglobin to form a compound of arsen-hæmoglobin, and of this chemical process there seems to be evidence in the diffuse yellowish tinge of the whole pulp tissue, and in the discoloration of blood in several of the blood-vessels.

IV. In nearly every case it is taken up in substantia (in form of molecules) into the bloodways; when there it produces, besides the above-mentioned changes, granular detritus of their contents and anæmic collapse, shrinkage—the latter effect being brought about nearly exclusively in cases where greater doses were used.

V. The bulk of the pulp tissue—viz., connective fibres and odontoblasts—undergoes no change whatever; not so the connective tissue cells, which increase 3—4 times their normal size.

VI. The special action of arsen. trioxyd. upon the nerve elements consists in the following: the neurilemma is only so far influenced that its nuclei are somewhat increased; a more essential change takes place in the axial part, where, after the application of more than one mgrm., granular detritus of myelin sets in, and the axis-cylinder commences here and there to disappear.

As a very surprising alteration, may be regarded the notchy tumefaction of the axis-cylinder, described heretofore almost only in cases of central lesions.

VII. All these alterations occur in and amongst normal looking tissue.

VIII. The action of arsen. trioxyd. is microscopically exhibited by a brownish-red tinging of the whole or of certain parts of the pulp body, as well as of the neighbouring dentine and cementum—this latter in cases treated with greater doses—viz., 2–5 mgrm. This alteration is most expressed at the top of the crown pulp, and at the apical $\frac{1}{4}$–$\frac{1}{3}$ part. This circumstance may be considered as an external evidence of the devitalisation being completely attained to.

IX. The conditions of the affection of the peridental membrane should be regarded as standing in connection with the degree of the above-named (VIII.) alteration, which again depends upon the quantity used, and the space of time during which it was left in contact. The smallest quantity (1 mgrm.) is able to produce a slight degree of injection.

X. Arsen trioxyd. if not brought into direct contact with the pulp—viz., when a thin wall of dentine lies between, does not produce any of the alterations before mentioned even in cases where 5 mgrms. are used. The inflammation produced in the experiment can only be looked upon as a product of the irritation of a foreign body put close to the pulp, and endowed with different conducting power for heat and cold.

XI. As_2O_3 seems not to have any action upon the dentine; although if left for a longer space of time under its influence, a slight tumefaction of some of the dentinal fibrils can be seen, while the hard substances do not alter at all.

Pepsinum.—I. The action of pepsinum upon the pulp tissue is quite different from As_2O_3—viz., greater doses (about 4—5 mgrms.) produce well-defined coagulation of the albumin; but intruded into the body of the pulp a circumscribed coagulation may be produced even by 1 mgrm.

II. This coagulation, when greater doses are used, may extend beyond the place of application, and reach as far as the apical end of the root-pulp.

The details of its action consist in the following changes:—

III. Close to the spot of application an injection sets in, inducing the same at the crown-pulp. At a certain distance from the drill-hole (= carious cavity), the inflammatory redness turns suddenly dark and forms a demarcational line, designating the limit of the action; hence the apical $\frac{2}{3}$, $\frac{1}{3}$, $\frac{1}{4}$ of the root-pulp—depending on the doses—is unaltered; the action is total only in cases where as much as 5 mgrms. are applied, and consists in the above-mentioned destruction.

IV. The blood-vessels become to a certain degree expanded, and their contents do not lose their pigment; on the contrary, the blood corpuscles exhibit a deeper tint, which approaches to purple-red. This change may find its explanation in the great hygroscopic power of pepsinum, inasmuch as by this way the water of the blood corpuscles is drawn out, and their pigment remains in a state of abnormal concentration. This very effect is also an evidence that the vascular disturbance is to be attributed to the same cause. So far as the quantity of pepsinum suffices for that purpose, so far its action will go. Therefore—

V. It is more probable that, if in such cases peridental inflammation ensues, this will be rather attributable to, and considered as, collateral hyperæmia. On the other hand, it does not seem probable that the disintegrating action of pepsinum should be able to extend over the aperture of the root canal.

VI. Greater doses (4—5 mgrms.) of pepsinum produce essential alterations in blood-vessels as well as in nerve-fibres. The former in their continuity become collapsed, or anæmia, together with fatty degeneration, commences to set in. The nerve-fibres undergo fatty degeneration only when as much sa 5 mgrms. are applied.

VII. Pepsinum, when not in close contact with the pulp—viz., through a lamella of dentine—produces no effect at all.

VIII. The hard substances if left for several days in a solution of pepsinum do not alter; only, perhaps, the dentinal fibres disappear, but the dentine gets covered with mycelium threads and spores of fungi.

[An investigation into the peridental membrane, and into the maxillary arteries, as well as the corresponding branches of nerves in the maxillary canal, could not be executed in the animals, because with the teeth of dogs it is impossible to peel off the alveolar wall and preserve the integrity of those parts, as would be required for such an inquiry.

Practical Part.

Arsenious acid and pepsinum being essentially different in action, the conditions of their application must also be conducted in a different way.

I. Neither of the agents has a devitalizing influence upon the pulp capable of extending through the dentine; they must be used so as to be in contact with its surface.

II. The quantities of the agents which would produce an insensible pulp are different, and the selection decides upon the quantity to be used; at the same time the size of the individual pulp must also be taken into account.

III. The smallest quantity to be used of arsenious acid is 1 mgrm. The greatest dose should not exceed 3 mgrms.

IV. The length of time arsen. trioxyd. must rest with the pulp should never exceed twenty-four hours, supposing that a quantity corresponding to the size of the pulp has been chosen.

V. A dose of arsen. trioxyd. even only from 1—2 mgrms. left longer than twenty-four hours with the pulp, may produce periodontitis; and if still longer, osteitis, periostitis, and diffuse inflammation of the surrounding soft parts may follow.

VI. The swallowing of arsenious acid in such a quantity is not likely to produce any discomfort to the patient; the smallest poisonous quantity being 1 centigramme; still care must be taken not to bring it into contact with the gum, &c.

VII. Pepsinum produces remarkable alterations only if a greater quantity of it be used, supposing this be intended to remain for twenty-four hours. If left for a longer space of time, for instance, 2—3 days, then even 2—3 mgrms. will do their duty. For 24 hours, not less than 4—5 mgrms. will have a destructive effect.

VIII. The smallest quantity (1 mgrm.) of arsen. trioxyd. is more efficacious in producing periodontitis in twenty-four hours, therefore, than 3—4 times the quantity of pepsinum.

IX. It would be advisable to use this agent in every case where rapidity is not essential. Special indications for its use would occur (1) in teeth of very young persons where a large aperture of the root canal may be supposed; (2) in persons who do not keep quiet, in whom a correct application of As_2O_3 would be disturbed; (3) in teeth with distal cavities where the margin of the cavity is under the level of the gum; (4) if the patient wants to interrupt the operation for 2—3 days.

X. Either of the agents having been used, the total extirpation of the pulp must follow in due time. If this is omitted periodontitis will result, in arsenious acid cases sooner, in pepsin cases later. In the first instance, directly by the chemical action of the agent, in the second, partly directly by the agent but principally by the fungi, which develop after a certain space of time, beginning from three days.

XI. The supposed effect of arsen. trioxyd. upon the odontoblast layer, producing secondary dentine, does not seem to be well founded, inasmuch as oxygen or hydrogen is indispensably necessary for its occurrence coming into action at all—and being put between a lamella of dentine, and the obdurating material (as gutta-percha, &c.) these conditions are hardly bestowed. It is more likely that break of continuity itself and additional irritation from any obdurating material would produce that effect.

On the Reproduction of Bones, with Special Reference to the Variable Portions of the Maxillæ.

Dr. W. H. Atkinson, New York.

Necrosis has been looked upon as a sudden stroke of death to a given territory of bone. This is the exact opposite of the truth, in every case that has fallen under my observation, in my own or the practice of others, be it hospital or private.

However sudden the privation of nerve-current and blood-current may be, there must be a period of solution of the lime salts of the part involved, to constitute either caries or necrosis.

It is to the understanding of this process, that we are indebted for correct diagnosis and treatment. And just here we enter upon the dispute between the old expectant, and the modern pragmatic extirpative methods.

The old says:—"Let alone, and await the setting up of the 'line of demarcation' before attempting to operate."

The new says:—"Extirpate the carious or necrosed portion, just so soon as it is possible to determine the portion deprived of the nerve and blood circulation." Thus limiting and marvellously lessening the extent of the destruction of tissue.

Just how far the solution of lime salts may extend, and the part still be amenable to re-solidification, is not definitely settled, but that vigorous cutting, at that time, through the dead and dying portion, well into the healthy adjoining tissues, is considered to be good conservative treatment, is no longer in doubt.

To comprehend the loss of tissues involves an understanding of their production, nutrition, and maintenance as displayed in embryological histology no less than the alternations of generation of the small bodies which are the elements, the changes of which constitute nutrition in the adult.

A sort of compromise between nutritional changes in the adult, and tissue metamorphosis in the embryo, is present in all reproduction of tissues, continuity of which has been broken by mechanical, chemical, or dynamic interruption of function.

All reproduction of tissue (other than that of nutritional maintenance) demands a utricle, or pocket, to contain the pabulum or protoplasm, from which is then to be evolved the elements of the new tissue, which is to be built according to the demands of the type of the destroyed portions of tissue; and this holds good pre-eminently in bones, nerves, tendons, and blood-vessels. I have not yet seen muscles reproduced in this way.

The prevailing methods in surgery of treating caries and necrosis by expectant treatment and drainage, should no longer be resorted to. The portions already dead, or greatly debilitated, should be thoroughly removed, well up to the healthy territory—securing a pocket to receive the pabulum, out of which to attain reproductions by what has been called "first intention."

All tissues arise from protoplasm, if we regard protoplasm as the first example of tissue arising out of pabulum, which is a reduced plasma of food elements. We shall then regard it as the one tissue. Modifications of which are presented in the various tisues composing the human body.

In the light of this view of the subject, we must give the following classifications of tissues:—

I. Protoplasm.

II. Indifferent or embryonal corpuscles.

III. Connective-tissue corpuscles, nerve-tissue corpuscles, and muscular-tissue corpuscles.

IV. Limitary-tissue corpuscles: (this is usually denominated "Epithelium," and is characteristic of skin, and some forms of morbid growths).

Limitary-tissue covers the body as a whole, and lines all tracts:—Phono-respiratory alimentary, genitary, urinary, optical, auditory, and sudoriparous.

To enter into questions respecting reproductions of epithelium from protoplasm, without resorting to the so-called "skin-grafting" method, and discuss the point of a possibility—of attaining a new formation not readily detectable as veritable "scar-tissue,"

would lead us too far from the immediate object of the paper—viz., "The possibility of reproducing the variable portions of the maxillæ when the teeth are kept *in situ*, but deprived of the alveolar plates constituting their sockets.

The tooth-bearing parts of the jaw-bones are the portions of these structures liable pre-eminently to caries and necrosis.

Examples of well-formed jaw-bones without teeth, in man, are too rare to afford comparisons as to liability to deteriorate, as compared to those with teeth.

No case of necrosis of an edentulous human jaw has come under my observation in history or practice.

Molecular metamorphosis (the commerce of tissues) constitutes the measure of production, maintenance, and destruction of tissues, and hence must be apprehended, to enable us to institute beneficent diagnosis and treatment.

Normal nutritional changes do not attract attention; but when disease (as aberrant molecular metamorphosis is called) invades the body, the abnormality forces recognition.

The disease is one in origin, and one in mode. Debility is its origin, and modification of tissue its mode, the degrees of which constitute its various manifestations.

Mal-nutrition is always asthenic; and induced by starvation through deficiency of food, or bad food, contagion, or misapplied remedies.

The important point is to be able to distinguish between the cases that are sure to result in destruction of bone territories, deprived of pabulum, when left alone, and those in which resolution may be expected before the "periostitis" becomes "osteitis." Bone structure is so low in nutritional endowment, that it is dangerous to trust to any constitutional or local treatment, other than prompt extirpation of the seat of inflamed bone, from which caries or necrosis is sure to spread if not promptly and thoroughly removed, quite up to, or slightly beyond, the limit of healthy territory.

To comprehend the reproduction of any tissue, organ, or system, it is indispensable to be acquainted with its introduction, maintenance, and loss.

The range and variety of method and management is sufficiently extensive to satisfy the most strenuous advocate for freedom—all the way from expectant or let-alone treatment, to "boiling oil," "lowered heat," "cauterization," and intermediate modes, down to the demoniac "imprisonment of the part in plaster bandages," and other means of "fixity," which may be instanced as the thorough-bass of textbook and journal doctrine.

If there be one predominant dead-weight in the path of the surgeon, it is the cold assumption that he knows exactly beforehand all the ins-and-outs of a complicated operation and how to perform it *secundum artem !*

Timidity and reverent regard for textbook authority, and the prevailing teachings of the medical schools, engendered hesitation and doubt as to the correctness of the deductions afforded by cases in practice.

Little by little advancement was made, as the light of success added confidence to the interpretations arrived at, under the inspirations of necessity, in cases pronounced hopeless by those in authority.

When several of these patients recovered, with little deformity, some of those who subsequently saw them denied that they had ever been veritable cases of necrosis. But this question was easily settled by the testimony of competent observers who saw them, and by, in some cases, producing the bones themselves that had been removed from territory now occupied by reproductions; which reproductions were so exactly normal in appearance and usefulness of function, as to defy detection as new bones, by any who had not seen them in the course of death of parts, removal, and the procurement of the requisite receptacle or pocket, in which the new formations were obtained.

This pocket, by the way, is the *sine quâ non* to success in these undertakings.

The heresy of the vaunted textual statements that "periosteum is the bone-producer" has now happily been set at rest by the discovery that reproduction of tissues follows the same course of metamorphosis as their orginal production.

All the periosteum that is still attached to the soft tissues surrounding a necrotic territory, and which has the uninterrupted supply of blood-vessels and nerves, is of great importance, and should be sedulously preserved.

But where the blood and nerve supply are cut off, the dead periosteum should be removed with the necrosed bone; since it is no longer able to perform its functions.

The principal use of the connective tissue (constituting periosteum) is as a support to nerves and blood-vessels, by which pabulum may be carried to its inner side next the bone, there to be converted into: "1st, Protoplasm; 2nd, Embryonal Corpuscles; 3rd, Bone-plates of Osteoblasts;" which, 4th, become true bone by deposits of the requisite lime salts; and, lastly, the periosteum then serves as a means of sheathing to bone and tendon at the places of attachment or insertion of the muscle.

The ado made by surgeons for the necessity of preserving periosteum where reproduction of bone is desired, will be superseded upon a close study of embryological bone production.

Written or spoken directions, however clear they may be, are less instructive than clinical display of diagnosis and treatment of cases of any sort; but especially of the simpler ones of necrosis and caries.

Clinical instructions of necessity are limited to the few who can come near enough to really take in the essential features of the examination, deliberation, and discernment of the diagnosis upon which the treatment depends.

A rigid adherence to rules in diagnosis frequently tends to render a true one impossible, as it often occurs, that a step in the operation must be taken before the diagnosis can be completed.

And furthermore, early symptoms are too obscure to be detected by any but the well-trained observer. Just as soon as the ability to detect to a certainty the departures from health that are liable to run into caries and necrosis becomes more general among practitioners, there will no longer be such predominant multiplicity of examples of this justly-detested disease!

I have a case in point—a case which I present you, showing reproduction of the alveolar plates, constituting the sockets of the inferior teeth, ranging from the second molar on each side, all of which are now standing in well-formed sockets, as will appear upon examination of this cast. The pulps died in the right inferior central incisor, and the left inferior lateral incisor, but they are now useful and beautiful as the other teeth, excepting a dark colour.

On April 22, 1865, Miss C. complained of pain in the right inferior first bicuspid. Dr. W. treated the tooth with arsenic, and in a week from that day, excavated and filled it. On the evening of April 29th (the day the tooth was filled), Miss C. suffered great pain, upon which a physician was called, who ordered hot poultices to the face. On May 3rd or 4th, Dr. S. C. Munroe was called to see her, immediately ordered the poultices off, and sent for me in consultation—at this time the plates were so necrosed that the teeth were very loose—they were secured by ligatures, and the processes removed through incisions in the gums. I gave her tonic treatment and astringent mouth washes—after securing the teeth well in position—and the result is before you in this cast, the impression for which was taken in May last.

The Study of Dental Surgery, and the means thereto.

Mr. John Tomes, F.R.S., London.

Dental surgery has, during the present century, with the full consent of the medical and general public, developed into a well-defined speciality. The medical practitioner refers all dental cases to a dentist, where one is at hand, and the general public select him as the fittest to help them in all cases of dental trouble. No apology therefore need be offered for the separate practice of dental surgery; neither need arguments be put forward in support of its continuance as a distinct branch of surgical practice. The necessities of society on the one hand, and the technical requirements of the dentists on the other hand, have determined the condition of separateness. But this great international meeting affords a fitting occasion to inquire how the accepted conditions can for the future be met, so that the public may be best served, for herein rests the sole cause for our presence, either as special or any kind of practitioners whatever.

Utility alone is the excuse for the dentist's existence, and the full recognition of this fact brings us to the question of how and by what available means he can become most useful. How he can best fulfil the trust imposed in him as a specialist, bearing in mind that on account of his supposed superior special knowledge he is consulted, and that he assents to the belief that the dentist is far more capable than the general surgeon in the treatment of dental ailments. Clearly his honour, nay, even his integrity, is pledged to render himself in the highest degree capable of discharging to the fullest the freely accepted duties, and to this end the obligations of the teacher are in no way below those of the student. In admitting the social necessity for the presence of the special practitioner, the need for his special education is acceded, and it is to the wide question regarded in detail, of what should be the education of the dental practitioner for the determination and the due development of which we, as practitioners and teachers, are responsible, that I would call the attention of the meeting.

Before proceeding further, however, let me state that I wish it to be understood that all I have to say upon the subject of dental education applies only to those who have yet to be educated, and to those who possess neither unusual fitness or unfitness for the pursuit of dental studies.

And, furthermore, I desire to state that any opinions I express as to what can and should be done, are intended to apply only to education in this country. It will be for the representatives of other nationalities to tell us what system of professional education is most applicable and suitable in their respective countries.

In the first and second decade of the present century, dental practitioners were few in number, and for the most part, but not in all cases, members of the medical profession who, at the outset of practice, had but slender knowledge of the duties of the dental surgeon, even as they were then understood, or, at best, had such an amount of special knowledge as the accident of a good or bad private instructor might impart. In all constructive matters he depended, from the first, on the assistance of dental mechanists. Other persons commenced their career as young men, or boys, in the laboratory of a dental practitioner, acquiring therein, in the course of an apprenticeship, extending over five or seven years, great manual skill, but whose claim to sound surgical knowledge, at the expiration of pupilage, could not be sustained; yet from this class of persons some of our most distinguished practitioners, of the last generation, were derived. The one class spent their years, when to learn is easy and authority in the teacher is effective, in the acquisition of manual skill; the other in the acquisition of medical.—I will not say "surgical knowledge" in the strict meaning of the term "surgical." Hence it came that practice was approached from two wholly distinct sides, and resulted in the production of two distinct

classes of practitioners: one competent to advise, the other competent to treat, but neither fully competent both to say what should be done, and to do it effectively.

Towards the end of the second decade, dentists began to increase in number, and each year, up to the middle of the century, brought new candidates for practice, the vast majority of whom came directly from the dental laboratory, and who were, for the most part, below the surgeon in general education, and in whose medical knowledge they had no share.*

Out of this educational difference arose an inter-professional division, not to say jealousy, in which society took but little interest, each person selecting for himself a practitioner, from whom he hoped to secure all the advantages treatment could effect, and the choice as often fell upon the unqualified as upon the surgically qualified dentist.

Among the more intelligent practitioners, it came to be freely admitted, that dental education, from its one-sided character, was in a very unsatisfactory condition; and after some years of discussion, the opinion was accepted that the general and special portions of dental training should go on simultaneously; so that skill of hand and surgical knowledge should be acquired in the days of our youth, when the power to acquire is at its best, and at the only time, indeed, when a high degree of manipulative skill can be acquired.

A consensus of opinion as to requirements having been gained, effective action soon followed. But we were not the first to recognize the necessity of a systematic dental education. Our American brothers not only felt, but provided for, the want, in the organization of dental colleges; and in following in their footsteps, and profiting by their experience, we accepted an obligation, which should at all times be freely acknowledged. The history of the organization, past and present, of the colleges has been published in "The History of Dental and Oral Science in America," 1876. From this work, from Dr. Eliot's address, delivered before the American Academy of Dental Science, 1878, and from the prospectuses of the colleges, I shall take the facts, a statement of which should be made in acknowledgment of the work of our predecessors, and of those differences of method, or of requirements in education, which differences of social or of national wants or opinions have rendered desirable or necessary.

In order to arrive at a right understanding of the constitution of the American dental colleges, it will be advantageous to refer very briefly to the state of medical education, and of the medical colleges, upon the lines of which the dental schools were, to a certain extent, of necessity framed. For this information I am wholly indebted to a "Special Report upon Medical Education and Medical Institutions in the United States of America," prepared for the United States Bureau of Education, by N. S. Davis, A.M., M.D., 1776–1876; and "The Relations of the Medical Profession to the State," by D. B. St. John Rosa, M.D., 1879.

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* In May, 1878, the number of *bonâ fide* United Kingdom dental practitioners was estimated at about 2000, by persons engaged in supplying them with instruments and materials used in the practice of dental surgery. This estimate did not include either dentists' pupils or assistants of any kind, or persons who performed trifling operations, or who merely extracted teeth in connection with the practice of pharmacy, or of any other business. The initial register, published in 1879, contains the names of 5291 persons, of whom 2049 alleged that they practised dentistry with pharmacy, 50 with medicine or surgery, leaving 2707 persons who practise dentistry as their sole occupation, 483 of whom are licentiates in dental surgery. If a reasonable deduction be made from the remaining 2224 as representing assistants, real and assumed, and of quasi practitioners who are known to have registered, the entries in the register will support the accuracy of the original estimate of the number of *bonâ fide* practitioners, whose registration was contemplated when the Dental Practitioners Bill was drawn.

In early days, Scotch graduates, who settled in America, organized a university drawn after our northern model, but it was soon found that educational demands upon the student, readily met in Scotland, were altogether beyond the powers of the youth in a newly settled country. Hence, to avoid failure, the standard had to be lowered in favour of private pupilage. After the War of Independence—according to Dr. Davis—universities and colleges sprung up in the several States, subject only to the dormant control of the legislature of the State in which they were situated, and from which they derived their corporate powers. Neither the dominant feeling of the country in favour of individual liberty, or the multiplication of graduating bodies, tended to arrest the progressive lowering of the terms upon which the doctorate in medicine could be obtained; and "the fact," says Dr. Rosa, "that the degrees conferred by the colleges became practically recognized throughout the whole country, as a sufficient license to practice medicine in all its branches, gave the student an opportunity of obtaining a degree wherever it was granted, upon the most convenient or easiest terms;" fully justifying the complaint of the president of the Medical Society of New York, in speaking of the medical colleges to the effect that, "The present necessary laxity in admission, and in final examinations, fairly overwhelms the land with physicians. Many of them are only so by title."

This is but describing a state of things that, in a certain degree, existed in our own country at no pre-historic time, and against which great efforts had to be made before it was brought within control, and practically to an end. Its bearing upon our subject is important, in so far only as it no doubt influenced the institution and constitution of dental colleges in America, created in 1840, and afterwards. The distinguished president of Harvard University, in his admirable address on dental education, divides the subjects which constitute the fitting education for the dental surgeon into those which are common to the general and to the special surgeon, and those which are peculiar to the latter. The general he estimates at three-fifths, and the special subjects at two-fifths, of the whole education; and there will be few dissentients to this division. Keeping Dr. Eliot's estimate in view, but that the medical degree was often given and taken on such easy terms, it would, from our stand-point, have been difficult to understand how it was that so many dental colleges undertook to educate their students in the principles of medicine and surgery, necessary to the dentist, in the presence of schools devoted to these subjects, furnished with all the multitudinous appliances necessary to successful teaching, and provided with teachers of experience and distinction.

The withdrawal of the dental student from association with the general, in the study of subjects common to general and dental surgery, offers here no educational advantage, in compensation for the injury his limitation to a special school would probably inflict. The separation might tend to produce a distinction of social position, to the obvious disadvantage of the dental practitioner, whose claim to the possession of the necessary amount of medical or surgical knewledge might be challenged by those who studied under more favourable circumstances, and under the guidance of eminent teachers. For, however little professional education may be forced upon the individual, there never has been a time when the diligent and determined student might not readily acquire a thorough knowledge of his profession in the medical schools of America or of our own country.

The position taken by the medical graduating schools, thirty-three in number, at the time (1840) when the first dental college came into existence, would inevitably influence the organization of the latter. It is not reasonable to suppose that the dental could, even if they would, exact a higher degree of culture than the medical colleges.

Still, even a casual study of the subject leads to the conviction that our trans-

atlantic brothers were, and are yet, strongly and rightly impressed with the absolute need of a thorough special training, and although not in a position to enforce its acceptance, yet offer to the student every inducement to acquire a sound knowledge of the special subject and the skill requisite for its practice.

The general subject appears to receive less attention, or, at all events, occupies in the dental colleges' prospectuses, a less prominent position. In some cases, indeed, it would almost seem that a college faculty considered that a sufficient knowledge of the general principles of surgery could be gained in the study of the special subjects. It may be so; but to the English dentist who, bent upon instituting, and indeed insisting upon, a suitable, and, at the same time, the highest attainable education for his successors, the order of things described seemed like putting the cart before the horse, and offered an example which should be followed only after a very careful consideration of all the attendant circumstances. It was felt in this country that the prevailing medical education was, in the matter of degree, not in excess of what should be required of the dentist; but that while it fell short to the extent of two-fifths of the whole in strictly dental knowledge, it exceeds by two-fifths in certain branches of medical knowledge, the amount which could reasonably be asked of the well-educated dental practitioner. This conviction was fully expressed in a memorial address to the Royal College of Surgeons of England in the following terms:—"The memorialists do not suggest an education and examination inferior to that required of the medical practitioner, but propose a certain difference in kind only, not a difference in degree—an education and examination specially adapted to the requirements of the dental surgeon, as distinguished from that fitted for the general surgeon." The value of the foregoing paragraph has not been fully or rightly estimated, either here or elsewhere. Equality of education, professional or otherwise, does not necessitate identity of knowledge. A parson, a lawyer, and a doctor, may be equally well educated. The degree of education may be the same in all; but some of the subjects embraced in each profession will be different. So it may be with the dentist and the doctor; the degree of culture may be equal, but the subjects of study will be in part different. It has been strongly urged that dental should come as supplemental to medical knowledge—that the practitioner should be a doctor first and a dentist afterwards. This opinion might perhaps be sustained if the position were reversed—a dentist first and a doctor afterwards, provided all or even the majority of students were sufficiently rich in money and time to extend the educational period from four up to six years here, or from three to four and a half in America, a condition of things which obtains neither in Great Britain, or, according to Dr. Eliot, in the United States.

We allot four years to the study of medicine, and the medical student has not an hour to spare for any other subject; hence it becomes needful to determine what subjects in the medical curriculum can be lessened in extent or wholly omitted, so as to give time within the same four years for the effective study of dental surgery as a science and a practice.

This problem has not, perhaps, been wholly solved; but as the last organizers of a complete scheme of compulsory dental education, it is hoped we may claim to have provided the most perfect curriculum hitherto brought into a nation's use. The details of this were determined by a committee of the Medical Council, consisting of the representatives of the several medical authorities which, under the Dentists' Act, grant dental qualifications.

The twenty years' experience of the College of Surgeons of England being placed at their disposal, the Committee reported in favour of, and the Council adopted without material variation, the curriculum originated by the aforesaid College. The subjects therein embraced will be found appended in a tabulated form.

The unconditional entrance upon an attested preliminary education, before a medical or a dental student is allowed to commence his professional studies, constitutes a feature of great importance in the existing regulations, inasmuch as it ensures to him an amount of knowledge, and of mental training, which renders him able to understand without difficulty the language of science, and to follow with comparative ease the methods of scientific instruction and investigation.

Before this great educational step was taken, pupils not uncommonly entered upon their professional studies so poorly informed, that much time was lost in attendance upon lectures which they very imperfectly understood, and consequently to them the first course served the purpose of general instruction, rather than of imparting available medical knowledge, and thus only of preparing them to take advantage of the second course of lectures upon the same subject.

Latterly, much has been said against the vast number of lectures students have been required to attend, and especially against the mere repetition of courses. The objection is, no doubt, valid, now that preliminary education is enforced, and the students thereby enabled to learn from one as much as they formerly did from two courses of the same lectures.

There may be difference of practice, but there can be no difference of opinion, as to the advantage to the student of an attested preliminary education. Before entering upon the consideration of the instruction common to a medical and dental education, I will quote a few sentences from Dr. J. M. Purser's "Address on the Study of Physiology," and ask you to read therein Dental Surgery for Medicine.*

"I have said your business here is to learn Medicine, and you learn the other subjects only as stepping-stones to this. You do not come here to be made anatomists, or chemists, or physiologists. If you want to be an anatomist, you must give your life to it; and so of the other sciences. But you learn those parts of these sciences which are essential in order that you may take the next step safely; so much anatomy, physics, and chemistry, as are essential to physiology; and so much physiology as is essential for medicine, of which you should know all that is known."

I will venture also to bring to your notice the following relevant paragraphs from the address of Dr. Michael Foster, in which he contends that topographical anatomy, which has hitherto been studied as in some part a mental training, should now give way, to a certain extent, in favour of a more complete knowledge of physiology.†

"I think I am not overstating the case when I say that, in the two years (or less than two years) which the medical student devotes to studies other than clinical, 60 or 70 per cent. of his time—in some cases even more—is spent on the study of topographical anatomy. That study may be regarded in two lights—as a discipline, and as practical useful knowledge. The late Dr. Parkes, in a remarkable introductory address which he delivered at University College, London, many years ago, insisted most strongly that its value as a discipline was far higher and more precious than its direct utility; and I imagine that the more one reflects on the matter, the more clearly this will appear. The details of topographical anatomy have this peculiar feature, that, though they can only be learnt with infinite pains and labour, unlike other things hard to learn, they vanish and flee away with the greatest ease. I would confidently appeal to my audience of practical men, how much of the huge mass of minute facts, which in their youth they gathered with so much toil, remained fresh in their minds two years after they passed the portals of the College; and how much now remains to them beyond a general view of the parts of the human frame, and a somewhat more special knowledge of particular regions, their acquaint-

* *British Medical Journal*, November 13, 1880. † *Ibid.*, August 21, 1880.

ance with which has been maintained with more or less frequent operations. I would confidently ask them what is the ratio, in terms of money or any other value, which the time spent in those early anatomical struggles—say over the details of the forearm—bears to the amount of that knowledge remaining after twenty, or ten, or even five years of active practice, or to the actual use to which that knowledge has been put.

"No, it is as a discipline, and not for its practical utility, that anatomy has been so useful; and this, indeed, may frequently be recognized in the questions set at examinations. When the candidate is expected to describe, within the error of a few millimètres, the structures traversed by a bayonet thrust obliquely through the neck, or is invited to reproduce written photographs, no less exact, of the parts which, from skin to skin, underlie a triangle or quadrangle drawn in ink on the front or back of the thigh, it is clear that the examiner has in view, not the needs of practical life, but an easy means of testing the proficiency of the student in mnemonic gymnastics. Of the value of anatomy as a discipline there can be no doubt. In past years it has served as the chief culture of the medical student—as the chief means by which the rough materials coming up to our great medical schools were trained to habits of accuracy, of exactness, of patient careful observation; and their memories strengthened by exercise for the subsequent strain which would have to be put upon them by more strictly professional learning. In this aspect the very sterility of the subject was a virtue. The mere fact that the separate details seemed to hang loosely, isolated in mental space, held together by no theory, by no ideas, inasmuch as it made the learning a harder task, increased its disciplinary value. Most wisely did the leaders of our profession insist that no trouble or expense should be spared to afford the neophyte this preparatory scientific training; and that, as far as examinations and the like can go, no pains should be spared to compel him to avail himself of the opportunities offered. Indeed, viewed as a branch of education, the machinery of anatomical instruction has for many years past not been equalled by any."

Dr. Burdon Sanderson, in his introductory lecture, says,* "The precious years which immediately precede a man's entry on professional duty, are far too valuable to be wasted in learning anything he does not intend to retain." If we keep in mind the lately expressed and published opinions of these distinguished teachers, we shall be qualified to form a just estimate of the current dental curriculum, regarded as a training in the principles of medicine, and of its relations to the current medical curriculum.

Without substantial differences there are some slight variations in the divisions, and even in the designations, of the lectures recognized by the several surgical colleges. On this account it will be convenient, in making a comparison, to take the respective courses of study of the English College; and the more so, as its dental curriculum has been in successful operation for the best part of twenty years. If, then, we refer to the tabulated statement in the Appendix, it will be seen that the dental student is required to attend one winter course of six months on anatomy, in a recognized medical school, and a second like course, or, in lieu thereof, a course on the head and neck. He is required to have dissected for nine months—in other words, during a winter and a summer session. The medical student, on the other hand, must attend, with no alternative, two winter sessions of anatomy, and dissect during a like time—or twelve months. In fact, the dental student is relieved of part of one course of lectures and of three months' dissections. But if any credit is to be given to the opinions I have quoted, enough surely remains even for the education in anatomy of the medical, and certainly for the dental, student.

We know quite well that the knowledge of a subject got up merely for the purpose

* *British Medical Journal*, October 9, 1880.

of a pass will not be retained; and who will contend that a minute knowledge of the anatomy of the foot will be of sufficient practical worth to the dentist to ensure its retention in his memory? and if not to be retained, then, precious time, Dr. Burdon Sanderson says, should not be wasted in its acquisition. That which is true of the foot is true, also, of the minute topographical anatomy of many other parts of the body, with the treatment of which, in disease, the dental surgeon is not directly or, indeed, indirectly, concerned.

A winter six months' course of lectures on physiology is required alike of each, but the dental student is excused the thirty lectures, or meetings of the class, on practical physiology compulsory on the medical student. But the former will do well to decline this exemption: for a full knowledge of physiology is equally required for the intelligent practice of any and each branch of surgery.

It is of all subjects the most interesting, and time cannot be misspent by any manner of student in its study. Neither need we fear that the knowledge of physiology will be lost either to ourselves or to those who may seek our services.

The attendance upon one six months' course of lectures on surgery during one winter session is required in each curriculum, but the attendance upon a six months' course of practical surgery, that is, of bandaging, the application of splints, &c., is not required of the dental student. A course of lectures on chemistry, and a three months' course upon practical chemistry, are required in each curriculum, together with a course upon materia medica and a six months' course on the practice of medicine.

The lectures upon forensic medicine, midwifery, pathology, practical pharmacy, and vaccination are, in the dental curriculum, replaced by other subjects. So much for the attendance at a medical school. We now come to the practice of a general hospital. The medical student attends the surgical practice three winter and two summer sessions, while the dental student attends two winter sessions. The former is required to attend clinical lectures on surgery during two winter and two summer sessions, but two winter courses only are required of the latter. And here the pupilage of the dental student at a medical school and general hospital ends; for he is not required to attend the six months' dressership, the post-mortem demonstrations, the practice of medicine and clinical medicine of the medical curriculum. But counting all omissions in attendance, can it be said with any show of truth that the dental student has not had ample opportunities—opportunities which within living memory were considered sufficient for the general surgeon—of gaining a sound knowledge of the principles and practice of surgery? and if in the individual case that knowledge has not been acquired, it will be for the surgical section of the Board of Examiners to refuse the qualification of which they, with the dental section, are the constituted guardians in the interest of the public.

The all-important special subjects comprised in the dental curriculum now claim our attention.

In these, the medical student takes no part, while it is in the exercise of them under the direction of his general medical knowledge that the dentist takes and holds his place in society.

The conditions imposed are that he shall, subsequent to his having passed the preliminary examination in general knowledge, have devoted four years to the acquirement of professional knowledge, have been engaged during a term of three years in the acquirement of a practical knowledge of mechanical dentistry under a competent instructor, have attended and taken part in the practice of a dental hospital, or the dental department of a general hospital, during a period of two years; have attended two courses or twenty-four lectures on dental surgery; a like number on dental physiology, human and comparative; one course on mechanical dentistry; and one course on metallurgy.

These, then, are the subjects and conditions which take the place of those remitted

from the medical curriculum, and who can justly say they do not impose a tax equal to the one remitted upon the intelligence, the industry, and the time of the student? It may, indeed, be contended that even a greater load is substituted for a lesser. For it is the opinion of those engaged in instruction, and those recently instructed, that nothing can be remitted from the special division of the dental curriculum. The hospital attendance must be exacted almost day by day in order to gain adequate manipulative skill, without which the practitioner would be as the musician who cannot play, the artist who cannot draw, the sculptor who cannot use the modelling tool or the chisel, or the dental critic who should be, but is not, able to equal the work he condemns. It is one thing to know the scientific principles of an art, but it is quite another to carry them into effect. This requires an amount of skill of hand which can be attained only by long and careful practice under competent teachers. The fingers must become unconsciously obedient to the will; they must follow it automatically as the fingers of the skilled pianofortist execute the mental reading of the work he is playing, or as the hand of the sculptor produces the form the mind has conceived. Short of this unbidden obedience of hand, the performer would be but an amateur, and his professional life one long apology—a life of words in the stead of work.

It will be admitted by all that skill of hand can be attained only by long practice, and few will contend that one time is as good as another for the training. Mr. Fawcett, has told us that the blind may, in their youth, be taught a bread-winning trade, but adults who lose their sight cannot gain sufficient skill to secure independence. We know that successful musicians and artists commence their studies while young, and give promise of power before they attain to manhood. If we turn to the artisan class, it will be found that he who fails to acquire skill of hand during his apprenticeship seldom attains excellence afterwards. There is no reasonable ground for doubt that the young hand develops anatomically in the direction of its exercise, and acquires thereby a power in that exercise to which the adult hand seldom attains. These facts have an important bearing upon the question of the time at which the dental student should proceed with his practical education; for the skill needed by the dentist in the beneficial exercise of his calling is inferior to none other.

The results of professional examination fully establish the fact that the medical and dental curricula cannot be fulfilled honestly in the same four years. Yet it has been urged that the entrance upon the special division of the dental curriculum should be delayed until the surgical education has been completed, thus putting off the manual training to a period when the attainment of excellence is difficult, and of the highest degree of excellence perhaps impossible. To devote the days of our youth to the acquisition of knowledge we do not intend to exercise, to the exclusion of knowledge by the exercise of which we propose to gain our bread, is, I contend, a very grave error, and the graver as the remitted portions of the medical curriculum can, without disadvantage, be taken up after the dental education has been completed.

My strong advocacy of the special must not however be interpreted as indifference to medical qualifications. I would give every encouragement to the attainment by students of the latter, not however as a substitute for, but as a supplement to, the dental degree. Educationally, the relations of the membership to the dental licentiateship may be regarded much in the same light as are regarded the relations of the fellowship to the membership. This view of the position of the two qualifications will, and indeed does, take effect in certain appointments. In many of our hospitals, although the membership of the College of Surgeons is a full qualification for practice, the governing bodies require that the surgical officers shall be fellows of their College. And when the fellowship of his college is required of a candidate—provided the fellowship betokens a higher degree of surgical knowledge than the membership—it may justly be required of the dental

candidate for office that he shall possess the membership in addition to the dental license of his college.

Upon the question of examinations and of examiners I need say but little. The former, being conducted by the same bodies, will follow in their character the lead of medical examinations, and it is provided in the Dentists Act that should the much talked-of conjoint scheme come into operation in medical, it shall do so in dental examinations. Parliament has ordered that the examining boards shall consist of surgeons and dentists in equal numbers. The examiners are the guardians in the public interest against incompetence, and should, as a matter of course, be independent of the pecuniary success of the schools, and collectively irresponsible for the professional instruction of the individuals they are called upon to examine.

In this connection the profession may be congratulated upon the recent determination of the Medical Council to enter in the Dentists Register surgical qualifications as additional to dental qualifications, on the ground that they indicate a further pursuit of the science of surgery than the licentiateship implies. It may be said that this step should have been taken at the onset; but those who have practical experience in bringing an Act into full operation know quite well that to succeed requires the free exercise of patience, perseverance, and last, but not least, of forbearance.

In reviewing the task imposed on the student, it may be asked whether I have not overstated the amount of special training needed to ensure the acquisition of the necessary manipulative power? I should answer no, with all the emphasis of which I am capable. For I contend that a high degree of skill of hand is absolutely necessary to professional competence—that competence is necessary to self-respect—and that self-respect is necessary to that professional rectitude without which personal comfort in practice would be imperilled, and professional status would be but a shallow fiction. Furthermore, that, with the existing opportunities, a high degree of skill can be gained by perseverance and the due expenditure of time in pupilage, and that it is the bounden duty of the teacher to press for, and the examiner to demand, its possession.

Sufficient reasons for the study and the practice of dental surgery as a speciality are recorded in the first pages of this address, to which a statement of the obligations and the scope of specialism will form an appropriate ending. In no other way can I more perfectly fulfil this latter purpose than by borrowing the very words used in his presidential address by our great master of thought and of speech—Sir James Paget—who therein says:—

"Many of us must, for practical life, have a fair acquaintance with many parts of our science, but none can hold it all; and for complete knowledge, or for research, or for safely thinking out beyond what is known, no one can hope for success unless by limiting himself within the few divisions of the science for which, by nature or by education, he is best fitted. Thus our division into sections is only an instance of that division of labour which in every prosperous nation we see in every field of active life, and which is always justified by more work better done.

"Moreover, it cannot be said that in any of our sections there is not enough for a full strong mind to do. If any one will doubt this let him try his own strength in the discussions of several of them.

"In truth, the fault of specialism is not in narrowness, but in the shallowness and the belief in self-sufficiency with which it is apt to be associated. If the field of any speciality in science be narrow it can be dug deeply. In science, as in mining, a very narrow shaft, if only it be carried deep enough, may reach the richest stores of wealth, and find use for all the appliances of scientific art. Not in medicine alone, but in every department of knowledge, some of the grandest results of research and of learning, broad and

DENTAL CURRICULUM.

Licensing Bodies.	General Medical Subjects to be attended at a recognized School and Hospital.										Certificates to be produced			Examinations sine Curriculo.
	Anatomy.	Anatomy of head and neck. Not less than 20 lectures, *or second course of anatomy*	Dissections.	Physiology. Winter course.	Chemistry	Surgery.	Medicine.	Materia Medica.	Practical Chemistry.	Attendance at a recognized General Hospital, with Clinical Instruction.	Of being 21 years of age.	Of having been engaged 4 Years in Professional Studies.	Of having passed a Preliminary Examination in Arts.	
Royal College of Surgeons of England.	Not less than 1 Winter Session	1 course	9 months	1 course of 6 months	1 course of 6 months	1 course of 6 months	1 course of 6 months	1 course	1 course	Not less than 1 year	21 years	4 years	1	Candidates who were in practice or who commenced their education as Dentists **Before Sept. 8, 1859,** and who at the time of the passing of the *Dentists Act* were practising in England, are admitted to examination, on the production of certain Certificates.
Royal College of Surgeons of Edinburgh.	Ditto	Ditto	Ditto	Ditto	Ditto	Ditto	Ditto	Ditto	Ditto	Ditto	Ditto	Ditto	Ditto	Candidates who were in practice **Before August 1878,** and apprentices who commenced their education as Dentists **Before August 1875,** are admitted to examination on the production of certain Certificates.
Faculty of Physicians and Surgeons of Glasgow.	Ditto	Ditto	Ditto	Ditto	Ditto	Ditto	Ditto	Ditto	Ditto	Ditto	Ditto	Ditto	Ditto	Candidates who were in practice **Before August 1878,** and apprentices who commenced their education as Dentists **Before August 1875,** are admitted to examination on the production of certain Certificates.
Royal College of Surgeons in Ireland.	Ditto	Ditto	Ditto	Ditto	Ditto	Ditto	Ditto	Ditto	Ditto	Ditto	Ditto	Ditto	Ditto	Candidates are admitted to examination **Up to August 1881,** on the production of certain Certificates, provided they have been in practice five years before the date of this application.†

Special Subjects.

Licensing Bodies.	Dental Anatomy and Physiology, Human and Comparative.	Dental Surgery	Metallurgy.	Mechanical Dentistry.	The Practice of a Dental Hospital, or of the Dental Department of a General Hospital.	Certificates of having received Instruction in Mechanical Dentistry during 3 years from a Registered Practitioner.
Royal College of Surgeons of England	Not less than 24 lectures	Not less than 20 lectures	Not less than 12 lectures, unless specially included in Practical Chemistry	Not less than 12 Lectures or Demonstrations.	2 years	3 years
Royal College of Surgeons of Edinburgh	Ditto	Ditto	Ditto	Ditto	Ditto	Ditto
Faculty of Physicians and Surgeons of Glasgow	Ditto	Ditto	Ditto	Ditio	Ditto	Ditto
Royal College of Surgeons in Ireland	Ditto	Ditto	Ditto	Ditto	Ditto	Ditto

† N.B.—*Every successful Candidate, previous to receiving the License, shall declare that he will not advertise, or pursue any other unbecoming mode of attracting business, so long as he holds the License in Dentistry of the College.*

deep, are to be found in monographs on subjects that to the common mind seemed small and trivial."

Such, then, are the lines upon which the study of dental surgery have been drawn, so drawn to secure adequate knowledge and skill in the practitioners, and with the view, therefore, to a certain difference in kind, but to equality in degree, between the compulsory education of the medical and of the dental practitioner.

If in this imperfect sketch I have entered at certain points too far into details, or occupied too much time in their description, extenuation for my prolixity may be pleaded on the score of the high degree of satisfaction, not to say pardonable pride, which the surviving members of my generation feel in seeing an educational scheme, in the origination of which they took part, completed and rendered national, and thereby a calling, heretofore of undefined position, elevated by the Legislature to the rank of a learned profession.*

The following table, drawn up by Mr. S. J. Hutchinson, shows the extent to which the Dental follows in the line of the Medical course of study.

A COMPARATIVE STATEMENT *of the respective Courses of Study required by the Royal College of Surgeons of England of Candidates for the Membership and for the Licentiateship in Dental Surgery.*

Curriculum for the Membership.	*Curriculum for the Licentiateship in Dental Surgery.*
1. An examination in Arts.	1. The same.
2. Being 21 years of age.	2. The same.
3. Having been engaged in acquiring professional knowledge during four years.	3. The same.
4. Anatomy Lectures : 2 winter sessions.	4. The same or second special course on the head and neck.
5. Dissections: 2 winter sessions : 12 months.	5. 9 months.
6. Physiology : 1 winter session.	6. The same.
7. Practical Physiology.	7. (Say) Metallurgy, 1 course.
8. Surgical Lectures : 1 winter session.	8. The same.
9. Practical Surgery : 6 months.	9. See 18.
10. 1 course of Chemistry (optional).	10. The same (imperative).
11. 1 course of Materia Medica.	11. The same.
12. 1 course of Medicine.	12. The same.
13. 1 course of Forensic Medicine.	13. } 2 courses Dental Anatomy and Physiology.
14. 1 course of Midwifery.	14. }
15. 1 course of Pathology.	15. } 2 courses Dental Surgery and Pathology.
16. Practical Pharmacy and Vaccination : 6 cases.	16. }
17. Practical Chemistry.	17. The same.
18. Practice of Surgery : 3 winters and 2 summers.	18. 2 winters. And 2 years' practice at a Dental hospital.
19. Examination of patients : 3 months.	19. (At a Dental hospital.)
20. Clinical Lectures on Surgery : 2 winter and 2 summer courses.	20. 2 winter courses.
21. Dressership : 6 months.	21. } 2 courses of Lectures on Dental Mechanics.
22. Post-mortem Demonstrations.	22. }
23. Practice of Medicine ; 1 winter 1 summer. Clinical Medicine.	23. } 3 years Practical Mechanical Dentistry.

The subjects common to the two courses of study must in each case be attended at a recognized General Hospital and Medical School, and the subjects special to Dental

* Dr. Butler (Cleveland, U.S.A.) and Professor Sheppard (Harvard University) expressed their unconditional approval of the British Dental Curriculum, and of the opinions advanced in the paper. Dr. Holländer described the state of dental education in Germany ; and Dr. Taft (U.S.A.), gave a short account of the early proceedings of the American Dental Colleges. Report of discussion. *The Journal of the British Dental Association*, October 15, 1881.

Surgery at a recognized Dental Hospital and School, or the recognised Dental departments of a General Hospital and School.

Four years is the time allotted to study for the Membership, and for the Dental Licentiateship, and six years will not be more than sufficient for the acquirement of the two qualifications.

Restoration of Contour the only way to keep the Margins of Enamel of the Proximate Surfaces of the Teeth permanently Separate and Prevent Recurrence of Decay.

Dr. Marshall H. Webb, New York.

For full restoration of contour it is necessary to gain space to prepare the cavity, pack the gold, and finish the filling. This must be done either by wedging at the time of performing the operation, or by previously placing or pressing wood, linen, tape, or cotton between the teeth. When the necessary space has been made in this manner, particularly between the incisor and cuspid teeth, white gutta-percha should be placed in the cavity or cavities, and in the space, to remain a day or two, or till the irritation incited by the wedging has passed away. Rubber ought not to be used for pressing teeth apart, for the reason that it excites far more irritation than other substances. It is often best to place a wedge of orange or box-wood between the teeth, even after having pressed them apart, not only to gain more space, but to arrest their tendency to approach each other, and to steady the organs for the performance of the operation, particularly if the irritation from the slow wedging has not passed away, so as to admit of the insertion of all, or almost all, the gold by the aid of the mallet.

When the cavity extends almost to the margin of the cementum, the gold should be built into and from the starting-point, along the cervical wall and grooves, and to the part where the convexity of the filling must be gradually increased, and when this much of the gold has been inserted with the mallet, and smoothly finished with fine separating or other files, the wedge of hard wood ought to be placed between such gold and the tooth adjoining, and sufficient space thus secured to so complete the filling that there shall be no space between the teeth, excepting at and near the necks.

A cavity within the proximate wall of a bicuspid or molar tooth should be opened into from the masticating surface (excepting in rare instances), because even when but little tissue *appears* to be decalcified, this surface would be almost reached upon the perfect removal of the disintegrated tissue, and the plate of enamel be liable to fracture if hard substances were to come in contact with it during mastication of food. By cutting away the enamel between the cavity and masticating surface, a clearer view is thus had, and the entire operation can be performed in a satisfactory manner, with certainty of good result. The sulci and fissures are usually imperfect, and they should be prepared and filled in connection with, and at the time of, the performance of the operation within the proximate wall. The margins ought to be evenly and smoothly finished with fine, sharp burs and chisels or files, and emery-cloth carefully used (the edges of enamel should be slightly bevelled in some cases, but never rounded), and a groove should be cut in the dentine along each wall of the cavity. This groove should be about a sixty-fourth of an inch deep, and must be made in the dentine just within and near the line of both the buccal and palatal or lingual portions of enamel, and ought to extend from the masticating surface to the cervical wall. A groove should not be cut along the cervical wall (excepting in some cavities in the incisor teeth), because of

there not being sufficient tissue at that part as to make it safe to remove any of it for this purpose. In the preparation of a cavity between bicuspids and molars, enough enamel toward both the buccal and palatal or lingual walls must be cut away to free the edges, thus enabling the operator to so restore the contour of the parts, and finish the fillings, as to keep the whole margin from contact with the tooth adjoining. This is the only way to permanently separate or keep apart the margins of enamel, and prevent recurrence of decay.

When a cavity has been prepared as described, a starting-point should be made in some part of the cervical wall, usually toward the palatal or lingual surface, and in that portion of the dentine which shall not endanger the pulp. This point, in which to start the filling, should only be deep enough to retain the small pieces of gold first introduced while others are being built upon them, and the filling is carried along to the groove in each wall of the cavity. The gold ought to be built against every portion of the dentine, packed as nearly perfect as possible along the enamel, and a little beyond its margins, and carried fully to the line that originally defined the contour of the part. To thus perform an operation, it is necessary to build that part of the gold nearest the buccal and masticating surfaces against the proximate surface of the adjoining tooth. By performing this operation with the electro-magnetic mallet, the passing of the packing-instrument from off the edge against or over which the gold is being placed, may not only be avoided, but the surplus material can be so trimmed away during the performance of the operation, that comparatively little trimming is afterwards necessary. Cohesive gold foil (about Nos. 30 and 60) for large, and foil, folded to No. 16, and 20 or 24, for small fillings, and which is not touched with the fingers, ought to be used in the performance of all operations, especially in the cases just referred to, and those where frail edges of enamel are to be supported and protected; and the gold should be made compact by careful malleting—preferably by the aid of a properly-adjusted electro-magnetic mallet. All gold should be cohesive, particularly where a mallet is used, so that each piece may remain just where it is placed, and also that the filling may always be one and inseparable. When foil has been so built in place that the substitution for lost tissue is complete, a thin broad saw, or a fine suitable file, should be used to trim down the surplus material to the prepared edge of enamel, and to aid in shaping the filling like the original contour of the part; after which, narrow strips of emery-cloth or paper cut a line or an eighth-of-an-inch wide, should be so manipulated as to properly finish the surface of the gold. When this has been done, and the rubber-dam is removed, the finishing should be completed by the use of fine pumice and silex on linen tape. The gold at the masticating surface should be trimmed down with fine burs, and made concave, or finished to represent the original contour or the outline of the part operated upon. The gold should be so placed in the cavity as to be flush with the prepared margins of the enamel, and made concave when such concavity is indicated. Restoration of contour prevents contact of the margins of enamel, and this prevention is necessary, especially when the tissues of the organ operated upon are not fully calcified. The contour of the tissue that is missing ought always to be so restored with gold that the enamel of one organ may be free from contact with that of the next in the arch, and that a part of the gold in one may be in actual contact with a small part of the normal tissue of, or with a filling (if one has been inserted) in, the adjoining teeth. In such cases solution of lime salt does not take place, because of the freedom from proximity, and the cleansing (by the saliva, or fluids taken into the mouth, if by nothing else) of the margins of enamel against which the gold has been placed.

When operations have been so performed as to entirely prevent fluids or semi-solids from entering between gold and enamel, and all discoloration has been removed from the surface of remaining tissue, the gold-tint may be seen through the light walls or edges

of the translucent enamel soon after the removal of the rubber-dam and completion of the operation. If an opaque or dark line or spot be visible at or near the parts where gold ought to be, in contact with the dentine or enamel, the operation has been imperfectly performed, and if not re-performed, as it ought to be, chemical action may soon follow, and the entire filling prove a failure.

Solution commences at, and often near, the parts of enamel that are in contact, and soon takes place along the surfaces that touch each other, and extends to the dentine where decay makes rapid progress. In those cases where the system has been maintained in normal condition during childhood and youth, and the tissues are first-class, disintegration takes place slowly, and does not usually become extensive, so that where enamel is dissolved superficially, it can be removed, and, after a finely finished surface is made, decay will not be likely to recur. In no case should a permanent space be made or left between the teeth, however, for even in such cases as those just referred to, food may so wedge against the gum as to bring about its recession, and exposure of the necks of the teeth, and finally lead to the formation of a cavity of decay at that part. Permanent separations ought not to be made, for the reasons that they interfere with mastication, annoy the patient, and, with few exceptions, do not prevent disintegration upon or about the surfaces that have been cut. The teeth again come in contact almost invariably excepting where antagonists prevent them; food, wedging between them, undergoes fermentation, and solution and decay takes place, and that, too, in a part of the tooth where it is difficult to perform a first-class operation. This may not take place, however, till long-continued pressure of food paralyses the nerves in the papillæ throughout the gum tissue pressed upon, and breaks the nutrient circuit or obstructs the movement of the molecules of living matter through that fine reticulated line between the gum and the brain, and the patient is therefore not notified of the presence of such obstruction to the neural and vascular circulation. This condition of the gum tissue as inevitably leads to the return of the elements to their embryonal state, as does interference with the nutrition of any other part of the system.

In those cases where tonicity is at normal standard, the gum is so close to the necks of the teeth as to prevent the lodgment of foreign matter beneath the margins; not only this, but the tissue fills the space between the teeth almost entirely, and protects the parts it covers. The gum should therefore be protected by full restoration of the contour of the enamel that is missing, and the gold ought to be finely finished at all points, that there may be no obstruction to the gum tissue again closing around the neck of the tooth operated upon. In this manner the margin of enamel at or near the neck of the tooth is protected by the gum, and, if the whole operation has been properly performed and finished, recurrence of decay at that part is prevented. If decay does not extend to or beneath the margin of the gum, both the enamel and dentine of the proximate, as well as the buccal surfaces of the teeth, especially those in which calcification of enamel is imperfect, ought to be cut away with fine burs to about the thirty-second or nearly a sixteenth of an inch above the part where the gum closes around the tooth, so that when the operation is completed, this part may be protected from particles of foreign substances. When the necks of the teeth are kept separate, as in Nature, and the gum is in normal condition, it protects the portion of enamel, and covers the well-inserted and finely-finished gold, which may be beneath its margins, so well, that disintegration and even discoloration of the surface is prevented. In after years, however, there may be lack of nutrition to the gum, or the circulation may not be full nor free in the capillaries of the part, and the tissues may not therefore close around the necks of the teeth so tightly, but become less firm in texture or commence to return to their embryonal state. If, then, there be such condition as to bring about decalcification of the enamel, decided

decay may take place above or about the cervical margin of the filling. Such cases are rare, however, because deficient nutrient action usually takes place at an age when there is least derangement of the saliva, and when deposit of calcific matter is likely to take place beneath the lax margin of the gum. Though there may then be no recurrence of decay, peri-cementitis sometimes follows, and the deposition of such calcific matter prevents the rebuilding of the gum-tissue, and keeps irritated or breaks the net-like arrangement of living matter between the epithelial and connective tissue-corpuscles.

Des Limites de la Curabilité de la Carie Dentaire.

Dr. E. MAGITOT, Paris.

La carie dentaire est, ainsi que nous le savons tous aujourd'hui, une affection curable. Mais il convient d'établir avant tout ce qu'il faut entendre ici par guérison.

Or on doit entendre par guérison : 1° La cessation complète et définitive des accidents divers qui occasionnent la carie ; 2° Le rétablissement de l'organe malade à ses usages normaux, c'est-à-dire, le retour de l'intégrité fonctionnelle.

C'est d'ailleurs sur ces deux termes que se pose aujourd'hui tout problème qui a pour objet la thérapeutique d'une lésion définie qui intéresse à la fois la substance anatomique d'un organe et son rôle physiologique. Ils sont de tout point applicables à la carie dentaire, laquelle consiste, comme on sait, en une destruction progressive, c'est-à-dire, en une perte de substance accompagnée d'une série de phénomènes variables de caractère et d'intensité, suivant les phases mêmes de cette destruction et la nature des tissus qui sont atteints.

Or, cette maladie, qui est aussi vieille que l'humanité, puisque nos ancêtres des âges préhistoriques en étaient déjà affecté,* à dû susciter, dès les origines de la science, des tentatives thérapeutiques. C'est ainsi que les auteurs de tous les temps et de toutes les écoles ont proposé des moyens de guérison qui consistaient surtout dans l'emploi de divers médicaments propres à calmer les douleurs, et quelques autres substances destinées à la réparation de la perte de substance par l'obturation. Mais ces indications étaient nécessairement bornées aux périodes initiales de la maladie, c'est-à-dire, au plus petit nombre des cas, aux formes les plus simples enfin, au delà desquelles apparaissait invariablement le procédé radical et définitif, la suppression de l'organe malade, l'extraction.

Aujourd'hui les tendances conservatrices de la chirurgie moderne doivent protester contre toute pratique qui n'aurait pas pour objectif la thérapeutique rationnelle et la restauration physiologique, reléguant l'ancienne opération de l'extraction pour les cas relativement très rares de complications extrêmes et à titre de procédé d'exception.

Les méthodes thérapeutiques sont d'ailleurs d'une simplicité très grande, elles sont à la fois précises dans leur emploi et sûres dans leurs effets. Elles apparaîtront belles du moins à tout médecin éclairé qui entrera dans cette voie. Nous n'avons pas ici à les exposer, cela a été fait à diverses reprises.† Notre but aujourd'hui est d'établir, par les chiffres d'une statistique rigoureuse, les limites même de cette curabilité, et l'on verra à quels résultats véritablement inespérés nous avons été conduit.

L'enquête à laquelle nous nous sommes livrés, a été faite publiquement et au grand jour d'une clinique ouverte. C'est ainsi qu'elle a eu pour témoins et aussi pour collaborateurs un certain nombre de jeunes médecins qui, depuis quelques années, ont bien voulu s'associer à notre pratique et écouter nos leçons. Nous dirons tout-à-l'heure la

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* Les restes humains des temps quaternaires contiennent une notable proportion de dents cariées.

† Voir "Traité de la Carie Dentaire," 8vo, Paris, 1867. Art. Carie des Dents, du "Dictionnaire Encycl. des Sciences Médicales."

part importante qui revient à quelques-uns d'entre eux, lorsque nous aurons abordé plus directement notre sujet ; mais nous croyons devoir, au préalable, rappeler dans un court résumé, quels sont les caractères, les formes diverses, les aspects variés que présente la maladie au sujet de laquelle nous avons entrepris ces études statistiques.

Or, on sait que la carie dentaire consiste en une destruction progressive des tissus durs de l'organe dentaire et que, procédant invariablement de l'extérieur à l'intérieur de la couronne, elle envahit et désorganise les couches successives qu'elle rencontre en suivant, d'une manière générale, comme trajet, une ligne verticale représentée par le rayon de cette couronne même.

Dans cette marche qui n'est que très secondairement modifiée par les circonstances accidentelles, la maladie peut se diviser en trois phases ou périodes successives, dont la distinction est de la plus haute importance au point de vue thérapeutique, et d'un grand intérêt à l'égard de la statistique.

1.—*Prémière période.*—Elle comprend l'altération de la couche d'émail isolément ; c'est le début de la lésion, et ce premier degré a pour limite profonde la couche superficielle de l'ivoire dentaire.

Cette forme est ordinairement indolente, aussi passe-t-elle le plus souvent inaperçue, et lorsqu'elle a été diagnostiquée par un praticien attentif, elle peut être, dans le plus grand nombre des cas, curable sans autres moyens thérapeutiques, que la simple résection au moyen de la lime ou l'obturation immédiate. Ces deux opérations, qui ont leurs indications spéciales, réalisent l'un des termes de la curabilité de la maladie, c'est-à-dire, l'isolement sans traitement préalable nécessaire. C'est là d'ailleurs une méthode employée empiriquement depuis très longtemps, et qui a donné toujours d'excellents résultats. Aussi n'est-ce pas pour cette forme élémentaire, pas plus que pour les premiers degrés de la période suivante, qu'ont été instituées et préconisées les règles de thérapeutique rationelle. Les recherches modernes n'ont fait ici que consacrer les résultats utiles de l'ancienne pratique.

Deuxième periode.—Elle répond à tous les degrés de carie qui occupent l'épaisseur de l'ivoire dans l'intervalle compris entre le revêtement intérieur d'émail et la couche qui tapisse directement la pulpe centrale.

Dès le début de cette période, apparaît la nécessité de la division des règles thérapeutiques qui comprennent d'une part la cure des accidents douloureux par les agents modificateurs appropriés, et d'autre part, la fixation et le maintien de la guérison par l'obturation, c'est-à-dire, l'isolement définitif et complet. Or, les accidents douloureux varient singulièrement suivant le degré plus ou moins profond qui a atteint la destruction. Ils sont ainsi tantôt simplement provoqués, tantôt spontanés, et les agents thérapeutiques appropriés appartiendront à la classe générale des astringents : acide phénique, créosote, tannin, et parfois aussi, mais à dose faible, le chlorure de zinc, l'acide arsénieux, &c.

Le but de cette thérapeutique est de provoquer une excitation ménagée des fonctions de la pulpe, c'est-à-dire, la réparation moléculaire des couches altérées de l'ivoire par la production dentaire secondaire. Cette méthode, basée sur l'emploi rationnel des astringents ou des caustiques superficiels, précédés, dans leur application, de pansements anesthétiques ou narcotiques, prépare en définitive les couches d'ivoire à recevoir, après une réparation moléculaire suffisante, l'obturation terminale.

Troisième période.—Elle commence avec la pénétration de la cavité centrale et la mise à nu de la pulpe pour se prolonger jusqu'aux dernières limites de cette cavité et aux canaux radiculaires. Les accidents douloureux nécessitent l'emploi de bien des agents sur lesquels nous n'avons point à nous étendre ici, mais le but thérapeutique essentiel est la destruction de la pulpe. Ce résultat se réalise par diverses méthodes,

soit l'ablation directe ou la destruction par diverses manœuvres mécaniques, soit la destruction par des agents caustiques et en particulier l'acide arsénieux. C'est à ce dernier procédé que nous avons eu presque constamment recours dans les faits que nous avons recueillis. Mais la thérapeutique est ici très complexe, car elle doit répondre aux indications les plus nombreuses et les plus variées. En outre cette dernière période de la carie est celle qui marque le début d'apparition des complications les plus ordinaires comme aussi les plus graves. Tels sont les faits de cloisonnement de la cavité de la pulpe, la périostite, &c.

Hâtons-nous de dire, cependant, que ces complications sont elles-mêmes les plus ordinairement curables. La plus redoutable d'entre elles, la périostite elle-même, lorsqu'elle n'apparaît pas sur une dent dont la couronne est absolument détruite, n'est pas au-dessus des ressources thérapeutiques. Si elle est simple, subaiguë, sans retentissement de voisinage, les caustiques, les émissions sanguines locales en ont facilement raison. Aiguë et phlegmoneuse elle ne représente pas, selon nous, une contre-indication au traitement. Chronique et localisée au sommeil elle peut encore être guérie par l'intervention de la méthode de drainage de la carie.* En cas d'insuccès de cette pratique, il subsiste une dernière et extrême ressource dans la greffe par restitution.† Seuls, les cas relativement rares, où une périostite prend la forme de phlegmon diffus de la face ou des régions voisines, relèvent formellement de l'extraction, procédé également applicable aux débris sans retour possible à un rôle physiologique quelconque, et qui provoquent des accidents inflammatoires du voisinage permanents ou répétés.

Nous venons d'indiquer ici brièvement les différentes étapes que parcourt l'affection qu'on désigne sous le nom de carie dentaire, et du même coup nous avons déterminé les limites de curabilité de la maladie. Les études statistiques que nous allons exposer ont été entreprises dès le début de 1874, et les résultats comprennent cette première année entière, soit douze mois. Devant cette période, tous les cas de carie, sans exception, qui se sont présentés à nous au hazard de la pratique, ont été soigneusement relevés et enregistrés dans les tableaux statistiques uniformes. Ces tableaux mentionnent toutes les conditions multiples relatives au sexe et à l'âge du sujet, au siège de la lésion à la période d'altération, aux procédés thérapeutiques appliqués, à la durée du traitement, et enfin à la nature et aux particularités diverses de l'obturation finale.

Enfin les cas considérés comme au-dessus de toute tentative de guérison possible, ont été enregistrés dans un relevé spécial; c'est la part proportionnelle de l'extraction.‡

Les résultats généraux de ce travail sont les suivants:

Les cas de carie dentaire observés et traités pendant le cours de l'année 1874 ont dépassé le nombre de deux mille. Nous nous sommes cependant arrêté à ce chiffre afin d'éviter un fractionnement dans l'une des données fondamentales de ce problème.

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* Du Drainage Chirurgical dans ses Applications à la Thérapeutique de la Carie Dentaire: *Bulletin de Thérapeutique*, 30 août, 1867.

† Voir les documents sur la Greffe par Restitution appliquée à la Périostite Chronique du Sommet: *Gazette des Hôpitaux*, 1875, p. 35 et suiv.: *Bull. et Mém. de la Société de Chirurgie*, 1879: *Comptes Rendus de l'Acad. des Sciences*, 6 Janvier, 1879. Voir aussi David: De la Greffe Dentaire: *Thèse de Paris*, 1877, et *Revue de Thérapeutique*, 1880. De l'Etat Actuel de la Greffe Dentaire par Restitution appliquée à la Cure de la Périostite Alvéolaire Chronique du Sommet: "Comptes Rendus du Congrès de Londres, 1881, p. 445.

‡ Nous ne voulons point dire ici que les seules extractions pratiquées dans le cours de l'année 1874 soient celles qui figurent dans cette statistique. Nous ne parlons ici que des extractions effectuées pour des cas de carie dentaire, passant sous silence, bien entendu, les ablations pour causes de déviations, d'anomalies, d'accidents de dent de sagesse.

Sur ce chiffre de 2,000, les guérisons figurent pour le nombre de 1,980, les extractions sont au nombre de 20, soit une proportion de 99 pour 100 pour les guérisons, et de 1 pour 100 pour les extractions.

Tel est le premier fait essentiel, qui se dégage tout d'abord, mais il se décompose à son tour en un certain nombre de conditions diverses que nous devons analyser :

Ainsi à l'égard du sexe des sujets observés, nous trouvons 1,138 femmes et 862 hommes. Nous ne saurons cependant inférer de ces chiffres une prédominance de la carie chez la femme. Ce qu'il faut conclure d'un tel rapport, c'est qu'au point de vue particulier de la thérapeutique, les femmes y apportent plus de souci que les hommes, et viennent plus souvent réclamer les soins spéciaux.

L'âge des sujets observés, depuis la naissance jusqu'à soixante-dix ans, montre que la période de plus grande fréquence des traitements entrepris est celle de 20 à 30 ans; vient ensuite celle de 30 à 50 ans, puis de 12 à 20 ans, &c. Enfin, on trouve une période infantile de 0 à 6 ans, pendant laquelle 12 caries seulement de dents temporaires ont été traitées et guéries.

Les considérations de sexe donnent des résultats très intéressants que nous devons détailler ici, et qu'on trouvera dans le tableau d'ensemble ; nous relèverons toutefois certains chiffres principaux.

Considérant la carie dentaire au point de vue de sa répartition aux deux mâchoire s nous observons que la mâchoire supérieure est plus fréquemment affectée que l'inférieure, la proportion est de 1,225 caries pour la première et de 775 pour la seconde. D'autre part le côté gauche est au côté droit dans un faible rapport de 992 à 1,008.

Un autre problème se présente à l'égard du siége relatif: c'est le degré de fréquence de la carie, suivant les diverses espèces de dents. Nous avons établis déjà dans un travail antérieur, une statistique de ce genre, qui portait, sans préoccupation thérapeutique quelconque sur un total de 10,000 caries.* Nos résultats actuels au sujet du traitement sont sensiblement conformes. Nous les reproduisons ici à titre d'éléments de comparaison.

STATISTIQUE DE FRÉQUENCE A L'ÉGARD DU SIÈGE

	Statistique 1867. 10,000 caries.		Statistique nouvelle 2,000 caries.	
	Nombre absolu.	Proportion pour 100.	Nombre absolu.	Proportion pour 100.
1re molaire inférieure	1,810	18·1	317	15·8
1re molaire supérieure	1,540	15·4	251	12·5
2e molaire inférieure	1,046	10·4	236	11·8
1re bicuspide supérieure	940	9·4	160	8·0
2e bicuspide supérieure	810	8·1	139	7·0
Incisive latérale supérieure	745	7·4	194	9·7
2e molaire supérieure	690	6·9	139	7·0
Incisive cent. supérieure	612	6·1	167	8·4
2e bicuspide inférieure	500	5·0	70	3·5
Canine supérieure	445	4·4	112	5·6
1re bicuspide inférieure	370	3·7	55	2·8
3e molaire supérieure	220	2·2	62	3·1
3e molaire inférieure	140	1·4	67	3·4
Canine inférieure	70	0·7	25	1·25
Incisive cent. inférieure	30	0·3	2	0·1
Incisive latérale inférieure	30	0·3	3	0·15
Total.....	10,000	Total.....	2,000	

* Voir "Traité de la Caire Dentaire," Paris, 1867, p. 48.

L'étude des périodes de la carie a donné, au point de vue de la guérison proportionnelle, les résultats suivants :

Guérison de la première période	22
Guérison de la deuxième période	1360
Guérison de la troisième période	598
Extraction pour des cas de troisième période accompagnée de complications graves	20
Total	2000

L'examen des moyens thérapeutiques appliqués fournit les données suivantes :

Dans les cas simples de première période, l'obturation immédiate sans traitement a été possible	18 fois.
Les pansements simples destinés à calmer une douleur légère ou à produire un simple écartement devant favoriser l'obturation ont été employés ...	412 „
L'emploi des astringents, tannin, acide phénique, irritants superficiels divers	1147 „
Les applications caustiques, acide arsénieux, chlorure de zinc, cautère actuel	370 „
La résection pratiquée au moyen de la lime ou des gouges spéciales à l'effet d'effacer une carie de début	25 „
L'amputation, qui consiste à réséquer complètement une couronne de dent cariée, dans le but de conserver dans la mâchoire un moignon, d'ailleurs indolent, qui sert de soutient aux parties et d'aide aux fonctions de la bouche	8 „
Enfin l'extraction se retrouve encore ici comme ressource des cas incurables	20 „
Total	2,000 „

La durée totale du traitement, extrêmement variable, bien entendu, suivant les périodes mêmes de la maladie, a donné un temps moyen de quinze jours. Cette durée, nulle pour les cas d'obturations immédiates au nombre de 18, a été parfois très considérable pour les cas de troisième période. Plusieurs semaines ont été souvent nécessaires pour amener la guérison à travers les complications les plus diverses. Enfin, les caries moyennes réclamaient le plus souvent cinq à huit jours de thérapeutique astringente. Les chiffres relatifs à ce point de vue figurent encore dans la colonne des moyens thérapeutiques.

Voici maintenant les chiffres, qui concernent les procédés d'obturation, c'est-à-dire l'opération qui termine le traitement et qui est destinée, d'une part, à restituer à l'organe guéri sa forme physique compatible avec son rôle physiologique, et d'autre part, à assurer la persistance de sa conservation, par l'application du principe déjà énoncé de l'isolement.

A cet égard, les obturations métalliques figurent pour le plus grand nombre des cas, et elle comprennent :

1° Les obturations faites de divers alliages (argent et étain ; argent, étain, or ; argent, étain, zinc, &c.), mélangés avec quantité suffisante de mercure ; leur nombre est de	1,059
2° Les aurifications proprement dites, représentées par le chiffre de	420

Cette disproportion entre les obturations métalliques ordinaires et l'emploi exclusif de l'or provient de diverses circonstances dont la principale réside précisément dans l'intensité même de nos tendances thérapeutiques actuelles. Un très grand nombre de caries, en effet, soit par leur étendue, soit par leur siège, leur direction ou leurs susceptibilités aux réactions inflammatoires, ne se prêtaient que très rarement aux manœuvres longues et aux pressions énergiques que nécessite l'aurification. Nous avons

donc été forcés de renoncer souvent à ce dernier procédé, malgré toutes les préférences que nous lui accordons en principe.

Pour des raisons analogues, l'emploi de certains ciments composés soit d'oxychlorure de zinc, soit plus récemment de certains pyrophosphates de chaux et de zinc a dû être préféré pour un nombre de cas que représente le chiffre de 450

Enfin des caries, le plus souvent des dents antéro-supérieures à parois très-friables, et auxquelles ne pouvait convenir aucun des procédés précédents, ont été obturées par un mélange de gutta-percha blanche et de silice fine. Ces cas sont au nombre de 18

D'autre part, figurent encore dans cette colonne des opérations terminales, les cas traités par simple résection ou amputation : leur nombre est de 33

Viennent enfin les extractions, dont la proportion doit figurer de nouveau ici 20

Total 2,000

Un dernier renseignement doit trouver place dans le relevé relatif à l'obturation en général, c'est celui qui fixe le nombre des obturations complètes après guérison de tous les accidents quelconques comparé au cas dans lequel un suintement séreux ou séro-purulent, provenant d'une périostite chronique, a nécessité l'intervention d'une particularité de procédé opératoire, l'installation d'un tube à drainage fixe et permanent.* Ces cas figurent sous les chiffres suivants :

Obturations simples, complètes	1,948
Obturations avec drainage	32
Extractions	20
Nombre égal	2,000

Ainsi s'achève l'exposé général de tous les détails que comporte une semblable statistique, et il ne nous resterait plus, pour clore cette enquête, qu'à donner le tableau d'ensemble qui en résume tous les éléments (voir ci-contre). Mais nous avons ici un devoir à remplir, c'est de signaler la participation qu'ont prise à ces patientes et délicates études plusieurs de mes élèves.

Le travail de répartition générale nécessitait une attention soutenue et une grande persévérance ; le docteur Pietkiewicz, qui était en 1874 notre chef de clinique, voulut bien l'entreprendre et y consacrer tous ses soins. Le même travail s'est continué pendant les années suivantes, et avec des résultats semblables, par le concours de plusieurs jeunes praticiens, parmi lesquels nous sommes heureux de citer les docteurs David et Cruet, de Paris ; Piotrowski et Ciunkiewicz, de Varsovie ; Quinet et Lambert, de Bruxelles ; et plus récemment les docteurs Redier, de Lille ; Aguilhon, Combe, Chauveau, de Paris, &c.

Plusieurs de ces médecins ont d'ailleurs contribué par leurs travaux personnels et par plusieurs thèses de doctorat à la démonstration aujourd'hui complète de la curabilité de la carie dentaire. Mentionnons, par exemple, le mémoire du docteur Gaillard, "Sur la carie dentaire, sa nature et son traitement ;"† un autre du docteur Maurel, médecin de la marine, "Sur le traitement de la carie ;"‡ la thèse du docteur Cruet, sur le "Traitement de Caries Dentaires compliquées ;"§ celle plus récente du docteur Combe, sur "l'Acide Arsénieux dans ses Applications à la Thérapeutique de la Carie Dentaire,"‖ &c.

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* Voir à cet égard notre travail, cité plus haut, Sur le Drainage Chirurgical dans ses Applications à la Thérapeutique de la carie dentaire : *Bulletin de Thérapeutique, loc. cit.*

† "Essai sur la nature de la carie dentaire." Lyon, 1867.

‡ *Archives de médecine navale*, 1877. § *Thèse de Paris*, 1878. ‖ *Thèse de Paris*, 1879.

TABLEAU STATISTIQUE DE 2000 OBSERVATIONS DE CARIE DENTAIRE.

Relevées au point de vue thérapeutique.

NOMBRE DE CAS 2000.		SEXE DES MALADES. Hom.	Fem.	AGE DES MALADES. Années.	Cas.		SIÈGE DES CARIES.	Côté droit.	Côté gauche.	TOTAL DES DENTS.	TOTAL PAR MACHOIRES.	PÉRIODES.	MOYENS THÉRAPEUTIQUES.	MODES D'OBTURATION.	OBTURATIONS simples ou compliquées de drainage.
Guérisons.	1980	850	1130	0-6	5	Mâch. supérieure	Incisives cent.	87	80	167	1213	1re période 22	Pansements: Simples ... 412	Métallique:	Obturations simples ... 1948
							Incisives latérales	102	91	193				Amalgames de métaux divers ... 1059	
							Canines	59	53	112			Astringents ... 1147		
				6-12	88		1re prémolaire	81	77	158					
							2e "	70	69	139				Aurification ... 420	
				12-20	460		1re molaire	129	118	247		2e — 1360	Caustiques ... 370		Obturations avec drainage 32
							2e "	67	71	138					
							3e "	30	29	59				Ciments divers, oxychlorures de zinc, etc. ... 450	
				20-30	814	Mâch. inférieure	Incisives cent.	1	1	2	767	3e — 598	Amputations ... 8		
							Incisives latérales	2	1	3					
							Canines	10	14	24			Résections ... 25		
				30-50	553		1re prémolaire	25	30	55					
							2e "	30	39	69			Obturations immédiates sans traitement ... 18		
							1re molaire	159	155	314				Gutta-percha silicée ... 18	
				50-70	57		2e "	117	117	234					
							3e "	28	38	66					
				70	3									Amputations et resections 33	
Extractions.	20	12	8	0-6		Mâch. supérieure	Incisives cent.	1		1	12				
							Incisives latérales		1	1					
							Canines						Extractions ... 20		
							1re prémolaire	1		1					
				6-12			2e "	"	1	1					
							1re molaire	2	2	4					
				12-20	2		2e "	1		1				Extractions ... 20	Extractions ... 20
							3e "	3		3					
				20-30	16	Mâch. inférieure	Incisives cent.				8	Extractions pour complications graves ... 20	(Durée moyenne du traitement, 15 jours).		
							Incisives latérales								
							Canines		1	1					
				30-50	2		1re prémolaire								
							2e "		1	1					
				50-70			1re molaire	2	1	3					
							2e "		2	2					
				70			3e "	1		1					
Tot. égaux.	2000	862	1138		2000			1008	992	2000		2000	2000	2000	2000
		2000						2000							

Ajoutons, pour terminer, tous nos remerciements particuliers au docteur Chauvsau qui a patiemment rassemblé et résumé sous nos yeux les documents qui figurent dans le tableau général par lequel nous résumons cette série d'études statistiques.

Conclusions: De l'ensemble des documents qui précèdent nous nous croyons autorisés à déduire les conclusions suivantes:

1° La carie dentaire est une affection curable dans l'immense majorité des cas;

2° Les proportions que donne à cet égard la statistique sont que la guérison est possible dans le 99 per cent, ce qui réduit l'extraction à 1 per cent;

3° Ces résultats s'obtiendront couramment dans la pratique journaliere, à la condition d'établir une thérapeutique rationnelle fondée sur un diagnostic exact des périodes et des formes de la maladie, et sur une notion précise des indications thérapeutiques que réclame chaque cas particulier.

An Investigation into the Effects of Organisms upon the Teeth and Alveolar portions of the Jaws.

Mr. Arthur S. Underwood, London, and Mr. W. T. Milles, London.

Mr. President and Gentlemen,—Mr. Milles and myself approach with some diffidence the task of laying our views, in their infancy, before a body of representative science from all parts of the world. In the presence of so many illustrious members of our profession, whose own well-established researches have so materially advanced Surgery in all its various departments, we should scarcely have ventured to address you without some apology or excuse; we have only one to offer, yet we think it is one you will all sympathize with and appreciate. It is a firm and rooted belief in the truth of our theory, and a hope, almost amounting to a conviction, that it will prove serviceable to humanity. Without further preface we will proceed to discuss it.

Introductory.

The effect of the presence of septic organisms in various parts of the body has been for some years the subject of vigorous discussion and inquiry. Up to the present time certain main facts have, we consider, been placed beyond doubt, and accepted by the general body of scientific men as incontrovertably established. We shall therefore assume, as axioms in our present inquiry, the main principles of the antiseptic theory. The object of our inquiry (undertaken some four years ago) has been to determine, as far as possible, to what extent germs were present in the dental tissues when in a state of disease, and to deduce conclusions as to the effects of their presence. The method we have pursued has been threefold:

1.—*Microscopical.*—The observation of numerous sections of morbid dental tissues, stained in such a manner as to render the germs plainly visible.

2.—*Flask Experiments.*—The exposure of dental structures in a healthy condition to the action of septic and aseptic fluids.

3.—*Clinical Experiments.*—The treatment of morbid conditions of the dental tissues with antiseptic agents.

The results of this threefold investigation have uniformly led us to the conviction that germs play an important part in the production and maintenance of morbid conditions of the dental tissues. With regard to the principal calcified dental tissue, dentine, and its destruction by caries, it is necessary to allude, for a moment, to the most commonly received views of the etiology of the latter disease. The old, "vital theory," may be passed over, as completely disproved by the successful experiments of M. Magitot and many others, who have produced caries in teeth not in connection with the living body.

With regard to the purely chemical theory, we cannot accept it as wholly satisfactory, for the following reasons:—

1.—Because the destruction of dentine effected by the action of acids alone under aseptic conditions does not resemble caries, either in colour or in consistency, it being colourless and gelatinous, the process uniformly attacking all parts of the surface.

2.—Because sections of dentine so destroyed show uniform destruction of the matrix, but not enlargement of the channels occupied by the fibrils; whereas the true caries first attacks the soft tissues—*i.e.* the fibrils—and encroaches from that *point d'appui* upon the surrounding calcified structure, thereby producing the characteristic enlargement of the channels, until two channels break into one, the intervening matrix being wholly destroyed.

3.—That although artificial caries has been produced exactly resembling true caries, we have failed to discover any record of an experiment in which this has been the case when septic influences were excluded. Two experiments have, indeed, been recorded in which the teeth were protected from septic agencies, in one by the addition of creosote, in the other by hermetic sealing of the flask, and in neither of these did caries occur. We assume, therefore, that two factors have always been in operation (1), the action of acids, and (2) the action of germs. Further, our own flasks show that malic and butyric acid, with saliva in a meat infusion, have not, under aseptic conditions, produced caries.

It may be asked, if a tooth can be decalcified by acids out of the mouth, and these acids are constantly in action in the mouth, then, if they produce caries, why can they not produce simple decalcification? To this it may be replied, that acids alone do not destroy a living tissue, that the stomach is not digested by its own acids until it has been removed from the body.

4.—Lastly, we would urge that when caries occurs in the mouth, it is always under circumstances more favourable to the action of germs than to that of acids. There is always, first of all, a minute pit or haven where germs can rest undisturbed and attack the tissue. We cannot, upon the purely acid hypothesis, explain why the same acids that originally caused the decay, gaining access through some minute imperfection of the armour of enamel, do not in the same mouth, or under the same condition, attack the wounded enamel at the edges of a filling. The germs cannot rest there; they are constantly washed away if the surface is fairly smooth, but the acids literally bathe the part (during the intervals between the acts of mastication, when the alkaline parotid and submaxillary saliva neutralize their action).

These considerations led us to seek for signs of the presence of organisms in carious dentine, with results that far exceeded our expectations, some of which are here this morning.

This theory which—for the sake of distinction, may be called "septic"—is rather an amplification of the chemical theory than a contradiction of it. Most probably the work of decalcification is entirely performed by the action of acids, but these acids are, we think, secreted by the germs themselves, and the organic fibril upon which the organisms feed, and in which they multiply, is the scene of the manufacture of their characteristic acids which, in turn, decalcify the matrix, and discolour the whole mass.

From our observations on cementum, to which caries has extended, we conclude that the process is very similar; the bioplasmic contents of the lacunæ and canaliculi afford board and lodging for the organisms, which multiply, and, when sufficiently numerous, decalcify the surrounding bone, so that the lacuna loses its outline and extends in all directions.

With regard to the pulp, its inflammation does not materially differ from that of any

other cellular connective tissue. The influence of germs upon such tissues, when inflamed, has been already demonstrated by Professor Lister. One peculiarity distinguishes this from kindred tissues, and that is, that a tooth being an absolutely shut box, its contents are singularly amenable to antiseptic treatments. Having once rendered them aseptic by means of a penetrating agent, it is easy to keep them absolutely so, by sealing the only opening of the cavity with a filling. With a view of testing this fact, the theoretical accuracy of which we could not doubt, I have repeatedly allowed the gangrenous contents of a pulp cavity in which suppurative inflammation has gone on, to remain in the tooth covered by a filling.

All that is necessary to prevent further disturbance is to soak them in a powerful antiseptic. I have chosen for this purpose a combination of iodoform and eucalyptus oil, because it is the most powerful and the most permanent in its effects. After a certain period, during which the cavity has been sealed with a temporary filling, if no disturbance has occurred, I have substituted a permanent filling, and with almost invariably the most satisfactory results. This treatment is, I think, eminently conservative surgery, and based upon sound surgical principles.

M. Magitot, in a recent most interesting article upon development of teeth, lays great stress upon the fact that the odontoblast layer is very essential to the health of the tooth; and if we can, by this method of dealing with the matter, avoid the otherwise necessary alternative of removing it together with all dead matter, we certainly give the tooth an extra chance. The more of the natural vital contents of the pulp cavity we can preserve *in situ* the better for the tooth.

Further, we would propose for your consideration a theory as to what is the probable course of behaviour of a tooth pulp under these circumstances, a theory at present only, but one which we hope to establish shortly by ocular demonstration, and lay before you in a mature form. Suppose a tooth, with a large cavity communicating with the pulp-chamber; suppose that gangrene and suppuration have extended down two-thirds of the pulp-chamber, and that the extreme periphery of the pulp (membrana eboris), and the contents of the apex of the fang alone remain alive; suppose the cavity cleared, and a small portion of the surface of the slough removed, and the rest carefully soaked with eucalyptus oil until all the existing organisms are destroyed, and the cavity then filled with a permanent and effectual stopping: what becomes of the slough? In every other part of the body a slough, that has been rendered and kept aseptic, is gradually absorbed by the neighbouring vessels, while new cicatricial connective tissue is laid down in its place; this has been repeatedly demonstrated in sloughs of the limbs, treated antiseptically. We therefore suggest that the same thing that happens in other parts of the body, under similar circumstances, happens in the pulp-chamber: the slough is removed gradually by absorption while its place is supplied by healthy cicatricial tissue; like all scar tissue, it is of a lower order than that which it replaces, but it is a living tissue. After a lapse of time, then, we imagine that, if the tooth in question were extracted and split open, its contents would be found to be a healthy connective tissue, and not a slough at all.

Experiments on the Living Subject.

Taking, then, for granted the facts established by Lister and others, relative to the effects of the presence of organisms in other tissues, we were convinced that the course of an alveolar abscess was profoundly modified by their presence also. An aseptic or a septic alveolar abscess seemed to us to differ very much in the same way as a simple and a compound fracture.

To render such abscesses aseptic, we have injected them with eucalyptus oil and iodoform, and dressed them with lint soaked in these substances.

By means of constant and careful dressings and injections, we have been for the last two years very successful in inducing extensive, and often old-standing alveolar, abscesses to run a rapid aseptic course of recovery. Wherever we have failed we have been able to trace our failure to the presence of a sequestrum, which has afforded an inaccessible refuge for organisms, and which, until Nature has rejected it, or surgical skill removed it, has kept up the mischief despite all applications. Mr. David Hepburn, in a recent able paper upon such obstinate cases, read before the Odontological Society, urged this fact very strongly and clearly, and we quite agree with him that, while dead bone is present, antiseptics may mitigate, but are powerless to annihilate, the disease.

Microscopical.

The sections upon which our observations have been made have been cut from fresh teeth, very shortly after extraction, and without the use of any decalcifying or softening re-agent.

We have subsequently stained them with an aniline dye (methyl violet), following as closely as possible the process recommended by Koch—a process which renders micrococci fairly distinct under a $\frac{1}{6}$ lens, with proper illumination. A few typical slides we have been enabled to show you, owing to the kindness of our friend, Mr. Nelson. I need scarcely add that as the powers are very high oil immersions ($\frac{1}{10}$, $\frac{1}{12}$, $\frac{1}{16}$), we shall ask you to refrain from touching the adjustments. We have also prepared some diagrams illustrating upon a larger scale the appearance of the objects. In dentine, which has occupied most of our attention, we have invariably discovered the channels containing the dentinal fibrils more or less infiltrated with germs—for the most part micrococci, oval and rod-shaped bacteria. These germs we find penetrating at first in Indian file, then more thickly, along the course of the fibrils. As they accumulate and choke up the channels they encroach upon the matrix, diminishing the distance between the fibrils until the matrix entirely disappears and the neighbouring channels join, and the whole tissue becomes one conglomerated mass of organism. Beyond the sphere of visible decay, sections cut from apparently healthy tissue show here and there a narrow line of micrococci or bacteria, like an advance guard, and such isolated tubes or germs probably penetrate far into tissue which the naked eye would pronounce sound.

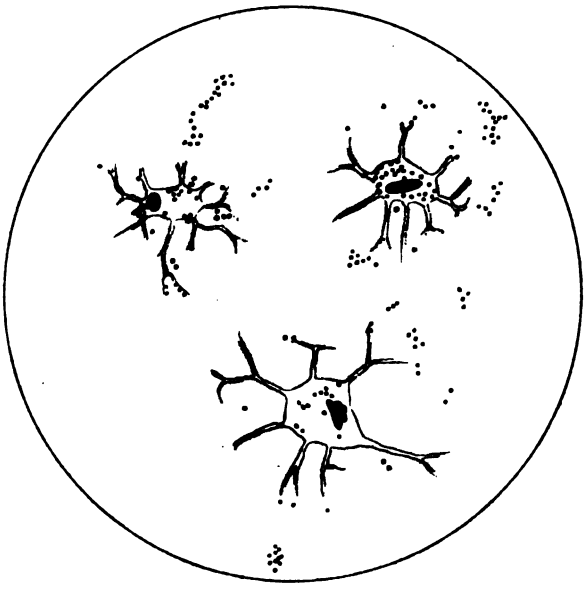
In decay, which has appeared in blocks of hippopotamus ivory worn on a plate, we have observed very similar appearances (see figure); also in some caries which we have produced ourselves in a flask, by exposing a sound tooth to septic agencies.

In cementum hitherto we have experienced some difficulty in obtaining sections of tissue into which caries has penetrated; but where we have succeeded we have found the lacunæ filled with germs. In some lacunæ the protoplasm of the osteoblast cell is slightly stained, the nucleus very deeply, and a few germs are seen scattered about in little groups. In others the protoplasmic contents of the space appear to have been totally destroyed, the outline lost, and the whole lacunæ crowded with germs.

Summary.

The preceding observations, together with the experiments with flasks and upon the living subject above referred to, have led us to adopt certain views which may be regarded as an extension of the views previously held upon the matter.

1.—We consider that caries is absolutely dependent upon the presence and proliferation of organisms. That those organisms attack first the organic material, and feeding upon it, create an acid which removes the lime salt, and that all the differences between caries and simple decalcification by acids is due to the presence and operation of germs. This view we propose to call the "septic theory."



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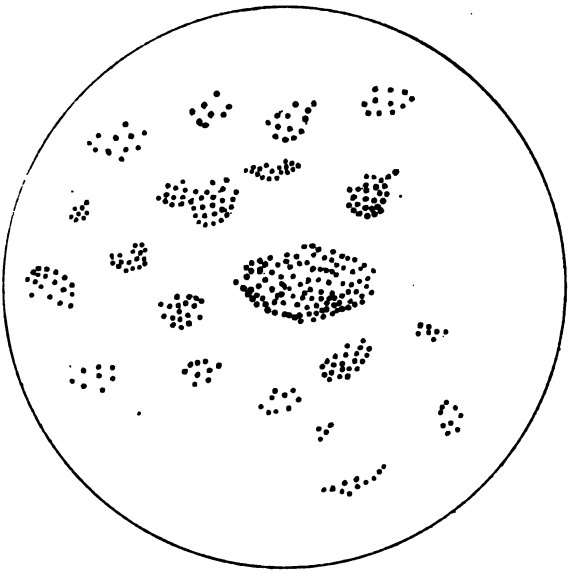
Cementum. Three lacunæ containing a faintly-stained osteoblast with dark nucleus and micrococci.



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Transverse section of dentine; micrococci in tubes.

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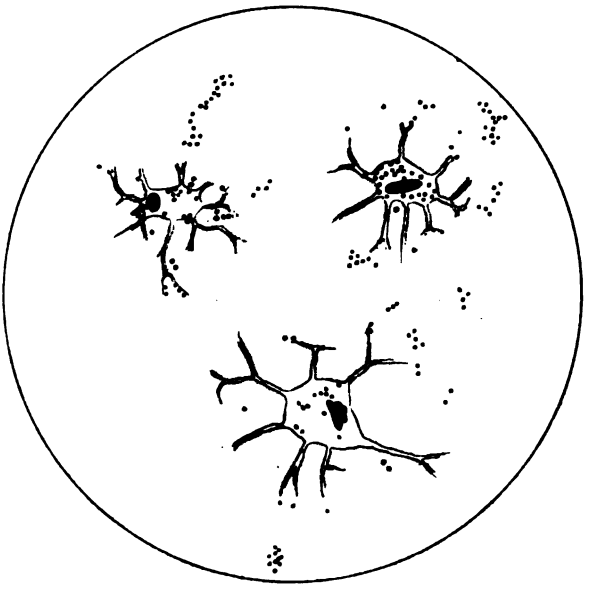

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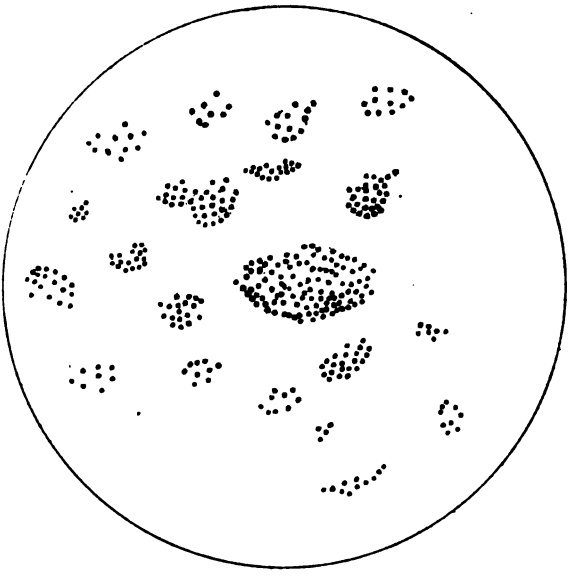

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2.—That suppuration of the pulp and its sequelæ, such as alveolar abscess, depend also upon the successful working of organisms.

3.—We feel justified in concluding that the successful exclusion of germs would prevent the disease, and that their exclusion is quite easy and practicable by the use of powerful and penetrating antiseptic agents, such as eucalyptus oil.

We have found that the space of time allotted to a paper rendered it quite impossible to enter into all the details of treatment and experiment we could have wished. These experiments have extented over three years, and cannot be condensed into a half-hour paper. All, therefore, that we have been able to do has been to lay before you the main facts and a few typical results, and in doing so we have been very kindly assisted by Mr. Nelson, whose microscopical arrangements have enabled us to show you our result in a more perfect manner than would have been otherwise possible.

DISCUSSION.

Dr. Taft, Cincinnati: The experiments detailed in the paper just read are very interesting indeed, and are fraught with instruction to all; but they can hardly be regarded as accounting for the production of caries of the teeth. The conditions that attend and surround the teeth in the mouth cannot be simulated nor imitated artificially. The experiments here given were conducted under a uniformity of conditions that is never found, and does not exist. The temperature in the mouth is ever varying; the substances in the mouth are changing constantly; and the agents produced by their decomposition or fermentation will be various, and subject to constant change. The agents producing decay are subject to change, both in kind and degree. In the mouth there are ever present substances that will produce coloration, more or less marked, and various in kind. In regard to parasites, I do regard them as active agents in dental caries, and not a cause, but a result, of decay; they are not a primary, but a secondary, element in the process. The cause of dental decay must be sought in some other direction, of which I will not speak.

Dr. Dentz, Utrecht: It appears to me that the experiments carried out by Messrs. Underwood and Milles, although exceedingly interesting, nevertheless lead to results identical with those obtained by Leber and Rottenstein, whose conclusions have already been sufficiently controverted by, amongst others, Messrs. Wedl and Tomes.

Mr. C. S. Tomes, London: In answer to the suggestion that the paper before us has been anticipated by older writers, and that it is inconclusive, I may be permitted to point out wherein it appears to me that the especial value and the thorough originality of the paper lies. Caries has been produced artificially many times, and by many observers, but with no special thought of septic agencies taking any part in the process; consequently they have always had their full fling. Mr. Underwood and Mr. Milles have shown, by many experiments, that the other conditions remaining precisely the same, in an aseptic flask caries never occurs; in a septic flask it always and speedily occurs. Whatever interpretation we may put upon this, it remains as a fact, contributed to our knowledge of the artificial production of dental caries, which can never be left out of consideration by any suosequent observer or writer on the subject.

Mr. Walter Coffin, London: described a treatment of extensive alveolar abscess by the evolution of oxygen rapidly, within the sac, by the injection into it of peroxide of hydrogen, forming with the secretions a thin froth, and strongly distending and thoroughly evacuating it. There is a complete antiseptic disinfection without coagulation.

Mr. Coleman, Streatham: said that the interesting and valuable paper they had just listened to was—whether it should lead to the adoption of the views of the writers or the rejection of their opinions—still a step, and a valuable step, towards our knowledge of the conditions or complications which are to be met with in the affection termed dental caries. There was this difference, that in the one case—in the mouth—the affection occurred in structures closely connected with living tissues, which was not the case in the artificial experiments. Mr. Coleman further said it would be very interesting could they follow out the ultimate results of abscess cured by antiseptics He had thought the matter much over, and considered it probable that the parts so treated might assume the condition of the carbolized catgut. If so, it was more than probable they would undergo the same changes as the latter did when introduced into the body—viz., to become gradually absorbed, and have their exact place supplied by new and healthy tissues.

Mr. S. I. Hutchinson, London: thanked Mr. A. Underwood and Mr. Milles for their most valuable labours, and believed they had got in the right groove for elucidating the action and cause of caries; but he must protest against the threatened abandonment of the term "dental tubules." The authors admitted that there were fibrils, that these fibrils ran in channels in the calcified tissue of the dentine, then, why should they be so ready to give up calling those channels—tubes? Mr. Hutchinson then read an extract from Dr. George Harley's paper in the Pathology Section, which went far to confirm the authors in their views: he says that "all disease germs tend to produce local as well as constitutional disturbance."

The debate was continued by Mr. Spence Bate, Plymouth.

Mr. A. S. Underwood, London: I have very little to add to Mr. Charles Tomes' speech, by way of reply; he has expressed my idea of the scope of my paper more clearly than I could have done myself. Dr. Taft has asserted that germs are not primary, but secondary, causes of caries; this assertion I must meet by simply saying that they are never secondary, but always primary. One assertion carries probably as much weight as another. Both Dr. Taft and Dr. Atkinson have misunderstood the drift and scope of my paper. We did not profess in the short space of twenty minutes to give a succinct account of the ultimate and elementary causation of everything connected with the teeth. The allotted time is scarcely sufficient to discuss the effects of germs, and we had no desire to enter into any other question. Dr. Taft must remember that the varieties of caries are just what we should expect from the varieties of the germs, hundreds of different forms having been already demonstrated. Dr. Atkinson asks me what "septicism" means. In England, we understand it to mean a condition in which germs are present. He also complains of the use of the terms *organic* and *inorganic*. I can only say that we are obliged to employ these terms in their ordinary sense, for simplicity's sake. Mr. Hutchinson asks an important question, afterwards repeated by Mr. Spence Bate, why are bacteria more lively now than 2,000 years ago, when decay was less rife? I answer that we are all more lively ourselves; we eat things and drink things that are not good for our enamel, and we contract diseases, traceable to civilization, that are not good for the enamel of our children, and thereby give the bacteria an opportunity to employ their energies on the weak points. Our progenitors ate simpler food and lived more simply, and therefore their enamel was better: and the progenitors of the modern bacteria had no chance of showing what mischief they could do. The primeval micrococci that dwelt in Mr. Bate's primeval skull were as powerful as those that swarm in the mouth of a modern dog (and even dogs are beginnning to have decay now). I must heartily thank

Mr. Bate for his clear and candid criticism. I hope he will investigate what we have said; we shall do so ourselves. We do not take it for granted or blindly believe it a bit more than you do, and if our further reseaches disprove it we shall be the first to say so. We quite feel, with Mr. Bate, that it would have been more satisfactory to have enlarged at greater length upon our experiments; but there is plenty of time before us for that, and we promise to do so. Do not expect too much all at once; we had an embryonic theory, and as you had a Congress we determined to broach it to you; of course, time alone can establish it, but we cannot give you a new theory, and, at the same moment, one sanctioned by time. Our bantling is in his cradle; we must wait to see what he will grow up to be. Dr. Dentz has also paid us a compliment I cannot pass over, in coupling our names with those of his distinguished countrymen, Leber and Rottenstein. I must, lastly, thank Mr. Charles Tomes for his clear exposition of our views. I do not think you have heard the last of them, and I confess to a suspicion that our endeavours to convince our very candid critic, Mr. Spence Bate, will be crowned with success; and I am sure that if we can prove our point to his satisfaction, he will be the first to confess the fact. One thing I think you will all agree upon, that, whatever the merits of the paper, it has produced a very animated discussion, for which, in the name of my colleague, Mr. Milles, and myself, I heartily thank you.

Remarks on the Administration of Anæsthetics at the Dental Hospital of London, from 1868 *to the present time.*

Mr. A. Coleman, London.

A reference to the records of the above-named institution shows that anæsthetics have been administered, within its walls, a little over twenty thousand times.

In the majority of cases nitrous oxide has been the agent employed; the next in frequency has been ether, used in conjunction with the former, upon the plan introduced by Mr. Clover. Ethylene-dichloride probably comes next in order, whilst chloroform, bichloride of methylene, and other anæsthetics, have been employed occasionally.

In reply to queries, Mr. Clover has kindly written to the following effect: "I continue to prefer dichloride of ethylene to ether or chloroform, in cases where the pure nitrous oxide does not keep up the anæsthesia for a sufficient length of time. The apparatus I use is the gas and ether apparatus I have had for several years. This enables me to begin with gas, and add the other gradually, without the supply of any more gas. I have had no dangerous cases attributable to the anæsthetics—none serious enough to require artificial respiration; but a few have been attended with the nausea and vomiting with which we are familiar after chloroform."

Mr. Braine also kindly states: "At the Dental Hospital of London I have, in by far the majority of cases, administered nitrous oxide alone. When a longer period of anæsthesia has been indicated, I have then employed that agent in conjunction with ether. I have never, during the period of my appointment to the above-named institution, encountered a case that has given me more than a few seconds' anxiety. In a few cases, where respiration has failed, I have had to forcibly compress the thorax with my hand; but have never had to employ artificial respiration otherwise."

Mr. Bailey also kindly supplies the following,—that he very rarely uses anything else than nitrous oxide at the Dental Hospital. In the only dangerous case, he had required to employ artificial respiration for three-quarters of an hour before complete recovery.

In the larger proportion of cases of administration, on the Thursday mornings,

(when the anæsthetic is usually administered by myself) a little ether is combined with the nitrous oxide. This is done with the objects of economizing the gas and prolonging the anæsthesia. The mixture of gas and ether is also, at a certain stage, respired over and over again, which reduces the consumption of both to a minimum; thus, a fifty-gallon bottle of compressed gas may be employed for sixteen to nineteen cases. From the time anæsthetics were first used at the Dental Hospital, to the present, only one really alarming case occurred, and that within the present year, when a young female ceased to respire during about five minutes, whilst artificial respiration was being kept up.

That so large a number of administrations of anæsthetics should have taken place at one institution, without any serious consequences, is a source of much congratulation and thankfulness to all connected with it; but there is, perhaps, another point for satisfaction hardly less important—viz., the immense advantage that the students at such a hospital must have, in witnessing anæsthetics administered so frequently and so efficiently as they are, by the distinguished gentlemen, Mr. Clover, Mr. Braine, and Mr. Bailey, who hold the post of administrators of anæsthetics, and who most regularly attend on their appointed days. No other hospital in this or any other country can, probably, present similar advantages.

Alveolar Abscess.

Dr. M. S. Dean, Chicago.

Mr. President and Gentlemen,—The causes of alveolar abscess and its pathology have been so minutely and accurately described by several learned authors that it would only be a waste of time for me to dwell upon the etiology of this disease, or upon its history. I will, however, state at the outset that I shall denominate as alveolar abscess no lesion except that which is associated with a tooth, the pulp of which has become devitalized; no matter whether the devitalization be of recent or remote occurrence. In other words, the death of the pulp will be regarded as the remote or indirect cause of the disease. The immediate or exciting causes, then, of alveolar abscess (properly so-called) are, the various matters and their products that find their way from the root canals, through the apical foramen. These irritating agents may arise either from the decomposition of the pulp tissues, or, at a later period, of the exudations that may have entered the canal through the apical foramen, or from the matters that may have entered the root canal from external sources; or, indeed, in some cases even, from the passage of liquids or gases through the canaliculi of the dentine and cement of the root. Any of these agencies, acting mechanically or septically upon the tissues surrounding the root, would cause inflammation, and, as a consequence, might terminate in alveolar abscess.

This is a very general statement indeed of the causes of the lesion which is made the subject of this paper. To trace its progress from its incipiency to its climax would be, as before intimated, only a waste of time, since its different progressive stages are well known to every dental pathologist.

The pathogeny of this disease being thus condensed within these narrow limits, it remains only for me to proceed to the practical question, its treatment. I shall in this confine myself to a few of the ordinary cases that are of the most frequent occurrence, of which some are regarded by many writers as incurable, and, unfortunately, are treated as such by many practitioners.

Alveolar abscess with fistulous outlets, whether of long standing or recent development, are the least difficult to treat, and are the most speedily brought to a favourable termination. Indeed, the treatment of such cases is exceedingly simple; and if the remedial agent is properly and thoroughly applied, a single operation usually results in

a permanent cure. To illustrate the mode of treatment in detail, we will take an example in practice. A fistulous abscess associated with a superior bicuspid having a large cavity on its distal surface—the gums somewhat inflamed and turgid. The first step in the treatment of this case—whether the abscess be acute or chronic—consists in adjusting the rubber dam to this and to the adjacent posterior tooth—if there be such. The decayed parts should then be removed, and a convenient entrance made into the root canal or canals, which should be enlarged, if necessary, with a Gates' drill, or other instruments suitable for that purpose, and thoroughly cleansed. A steel broach should then be passed gently through the apical foramen to remove any obstruction to the passage of liquids. This last operation sometimes requires considerable patience, especially so when the end of the root is somewhat curved. The next process consists in the injection of creasote through the apical foramen into the abscess. This operation should not be discontinued until the whitened orifice of the fistula gives evidence that the remedy has reached this point.

A simple method of accomplishing this, and one that has proved entirely satisfactory to myself and to others, is this: Fill the root-canal with a light pledget of cotton, saturated with creasote; then introduce a soft ball of vulcanite into the cavity of decay; now, with a few quick and forcible impulsions, with a round-headed instrument upon the soft rubber, the creasote will be forced through the apical foramen and the mouth of the fistula. The injection of the abscess and fistulous tract having been accomplished, the root-canal or canals may now be filled tightly with cotton, slightly moistened with creasote, and the cavity of decay sealed up so securely as to prevent the entrance of the fluids of the mouth. If the details of this simple operation are carefully carried out, no additional treatment will be necessary in a great majority of cases to effect a permanent cure.

After the lapse of five or six days, the fistula will be found closed, and the pulp canal should now be completely filled with some durable and impervious material. But before the temporary stopping is removed, the rubber dam should again be applied to the tooth in order to prevent the possibility of any contaminating matter entering the root-canals. This last point is so essential that I wish to strongly emphasize it here; for a successful result would generally, if not always, be thwarted by any infectious matter—the fluids of the mouth even—that might enter the root-canals subsequent to the first step in the treatment of the case. No matter how badly broken down the crown of the tooth may be, or swollen the surrounding parts—an alveolar abscess of the character just described will readily yield to the treatment above indicated—as a rule.

The treatment of the teeth anterior to the bicuspids is, in some respects, still more simple; the roots being straight, and the canals more cylindrical. In these teeth it is sometimes better—if not too much weakened thereby—to make a direct opening into the canal from the lingual aspect. In other respects, the treatment of these teeth is the same as in the case just described. It is hardly necessary for me to state that this treatment applies equally well to abscessed roots upon which artificial crowns are to be secured.

The treatment of fistulous abscesses, that are associated with the molar teeth, is somewhat more complicated, inasmuch as it is more difficult to obtain free access to the root-canals; but when these are once opened up, a cure is generally quite easily effected by adopting, essentially, the same method as that described for the single-rooted tooth.

In the foregoing I have had in view those alveolar abscesses in which fistulous openings had been already established. We will now briefly consider the treatment of those abscesses which are generally far more difficult to manage. Having no fistulous outlets they are sometimes called "blind" abscesses; some of these yield readily to treatment especially if they are not of long standing, yet they require more cautious

management. The cavities of decay and root-canals should be cleansed, as in the cases just cited, but greater care should be exercised in the manipulation, lest some of the débris be forced through the apical foramen. It will be readily seen that this care is more necessary in the treatment of the lower teeth than of the upper. After the operation of cleansing the cavity and root-canals is completed, if the pus does not already flow into the canal, a broach should be passed through the foramen and the pus and serum that follow the withdrawal of the instrument should be removed or wiped out until it ceases. Then make a piston by winding cotton around a suitable instrument—the head of a Gates-drill does very well—and saturate it with eucalyptus oil or phénol sodique. With this as much of the pus as possible should be forced or pumped from the abscess. Of course the cotton should be removed from the instrument and renewed many times. By this means the remedial agent will be forced through the foramen and drawn out again, bringing with it a mixture of purulent matter. By repeating this operation several times nearly all the contents of the sac will be removed. I prefer the eucalyptus oil or phénol sodique to creasote or carbolic acid in this operation, because the latter, by coagulating the albuminous ingredients of the pus, affect its fluidity, and thus increase the difficulty of drawing it through the apical foramen. After the contents of the sac are measurably exhausted, a little creasote may be injected into the abscess, and the root, or roots, be filled with a light pellet of cotton, and the cavity be sealed up. If there is not a sufficient quantity of creasote in the canals to saturate the cotton, a little should be added. On the second or third day subsequent to this treatment the temporary stopping, and the dressing in the canals, should be removed. To a practised eye, the appearance of the dressing taken from the canals will often indicate the condition of the parts beyond the apex. If pus should be found in the meshes of the cotton, or if serous fluid, or pus in small quantities, should in a few minutes ooze through the apical foramen, or, if we find there has been a leakage of the temporary stopping, the same treatment should be repeated. The second treatment will, as a rule, be sufficient to cure the abscess. But, in most cases, I would advise the removal of the second dressing after about a week's time, and again to pack the root-canals tightly with cotton moistened with creasote; and then to securely fill the remaining cavity with a trial filling that might remain for a month or more.

This is all the treatment that is required to cure the great majority of cases of this class. But occasionally we meet with a case that will not yield so readily. In such a case, after a faithful course of treatment with creasote and eucalyptus has proved ineffectual, it would be well to substitute aromatic sulphuric acid. The effect of this remedy in these stubborn cases, though somewhat painful, is often truly wonderful; and one application is frequently sufficient to arrest the secretion of pus. The subsequent treatment would be the same as that adopted in milder cases. In some of these cases—especially those of long standing—when the external wall of the abscess has become thin and yielding, the quickest, and perhaps the least painful, method to pursue, would be to produce an artificial fistula with a trephine, or any other instrument.

The lesions may be then treated as before described for fistulous abscesses. Of course, if there be necrosis of the osseous parts, the removal of the sequestrum, and the substitution of aromatic sulphuric acid, will be indicated, and will generally result in a speedy cure.

Abscesses, with fistulæ opening externally upon the face, yield readily to this treatment, without the loss of the teeth that are associated with them. Even those of many years' standing, may often be cured by a single injection of creasote or carbolic acid. You are all aware that abscesses of this nature quite frequently arise from the death of the pulp in the inferior incisors that are entirely free from decay; the cause being frequently

overlooked by the medical, and sometimes even, by the dental, practitioner. Cases of this kind, which had been treated externally for a series of years, have come under the observation of many of you. By applying the same principles recommended in the first case described, an abscess of this character may be cured almost invariably by an operation requiring thirty minutes', or at most an hour's time and the tooth retained in its usefulness.

Perhaps it may not be amiss, here, for me to suggest that the opening should be made posterior to the cutting edge of the tooth (I speak of the inferior incisors), and in as direct a line as practicable with the longitudinal axis of the root canal. This is easily accomplished by the aid of the dental engine, and a right-angle attachment armed with a triangular spear-pointed drill, having a small and slightly flexible shank. I need not detain you with the further details of this operation, as they have been fully suggested by the foregoing treatment of the bicuspid. I will bring this imperfect sketch of the details in practice to a close after a few words concerning the treatment of incipient alveolar abscess. Of course it is often difficult to distinguish an incipient abscess from periostitis when the latter is occasioned by the mephitic gases or other irritating matters that find their way through the apical foramen. But this is of no practical importance, since the same treatment that is adopted for the one is applicable to the other. In cases of incipient abscess the rubber dam should be applied as in the cases before named, and after having removed the parts softened by decay, the dead pulp or other matter should be carefully removed from the canal. It would be better not to thoroughly remove the débris at the first sitting, lest in the attempt to do this we force matter through the foramen, and thus aggravate, rather than ameliorate, the trouble. After this partial cleansing of the cavity, a pledget of cotton, saturated with eucalyptus, or dilute creasote, should be delicately introduced into the canal, and the cavity sealed up with cotton and sandarach varnish. In this operation pressure should be carefully avoided. The margins of the surrounding gums should then be touched with a solution of iodine in creasote. This may be conveniently done with a small spatula that will pass between the circumjacent gums and the neck of the tooth. After three to five days the cavity of decay, and the root canals, should be thoroughly cleansed, and the latter now filled densely with cotton moistened with a little creasote, and the former with gutta-percha or some other impervious material. For an incipient abscess—or periodontitis from the cause already named—this treatment will (with very careful manipulation) generally prove all-sufficient. It is, of course, understood that the fluids of the mouth must be absolutely excluded from the cavity, from the commencement of the treatment until the cavity is permanently filled.

Civilization in its relation to the Decay of the Teeth.

Dr. Norman Kingsley, New York.

The most important undetermined problem now confronting the dental profession is embodied in the inquiry made daily by anxious parents in substantially the following form:—" Why do my teeth decay more rapidly than my father's or mother's did, and why are my children's teeth decaying at an earlier age than mine?"

This inquiry does not come from those who neglect their teeth and who never consult a dentist until a throbbing pain betrays an exposed nerve. It does not come from the lower classes of society, the ignorant, or the depraved, who are as habitually careless of their teeth as they are of every other personal attention.

It is not confined to any race or nationality, nor is it affected by the seasons, climates, or locality; but it does come from a class which is the most intelligent, the most cultured,

and the most finely organized in any community, irrespective of race, locality, or climate, from people who appreciate the importance of hygienic laws, who give much care to the preservation of their bodily health, and who are attentive to their teeth.

This inquiry, when put to the professional adviser, frequently betrays great anxiety for the present condition, and alarm for the final results. It is useless to treat it lightly, or attempt a denial of the premises; for although the inquirer may have no statistics to sustain his impressions, he has a knowledge and a memory which is almost equivalent to a record, and his opinions are confirmed by the observations of most of his acquaintances.

The cases are exceedingly rare, if they exist at all, where the teeth of the children are sounder than the parents', and we must admit the conclusion that with each succeeding generation the dental organs are becoming more and more degenerate.

The dental practitioner holds the position of one in authority to his patients, if he be anything more than a mechanic, or makes any pretension to scientific attainments; but what response has he to their inquiries?

It is not difficult to formulate an answer that will satisfy many. It requires but little tact, and less knowledge, to give a reply that appears to impart information, but which really only covers ignorance and pacifies the patient. Even those who are well versed in other branches of science are often satisfied with an answer that will not bear investigation, and may even be absurd.

In this way is heard daily a repetition of the theories and speculations of a generation which have just enough foundation in truth and just enough plausibility to escape being challenged.

Probably the most universal idea among cultivated unprofessional people of the cause of the decay of teeth, especially among children, is "candy." At least, nine-tenths of parents seem to think there is no other cause, and half believe that, with all their efforts to keep candy away from their children, they must be eating it surreptitiously, or their teeth would not be found decayed.

There is probably no more fallacious idea so generally believed. How it should have obtained such wide-spread credence is difficult to conceive; it has just sufficient plausibility to save it from rejection.

But pure candy, in moderate quantity, never harmed any healthy child or adult. Pure candy, which is only sugar in a fanciful form, is as legitimate an article of diet, within moderate limits, as pastries, pickles or preserves, or a hundred other inventions for gratifying the palate, and if all other factors were eliminated from the problem, candy might be eaten with impunity.

Another speculation which has gained some credence is contained in the discovery that ice water, hot drinks, or hot cakes are the cause of all the mischief. It was even gravely asserted, at a gathering of professional men a few years since, by a gentleman who had no mean pretensions to scientific acquirements, that the common habit among Americans of drinking hot coffee or tea, to be followed by ice water, caused a sudden alternate expansion and contraction of the enamel, which produced cracks, which ultimated in cavities of decay. It is very doubtful if a cavity of decay ever originated from that cause, and certainly it is not possible that such a cause can have any very considerable direct influence. Neither ice-water nor hot drinks are any perversion of Nature's provision for man's health or comfort.

If there are any pernicious results following their use, from which the teeth suffer, it is not in their directly causing caries or other injury to these organs.

Another favourite theory held by some professional gentlemen is that of "living upon soft food instead of that which requires mastication." It has a seeming plausibility from the fact that the principal tissues of the body become strengthened by the severity

of their use, and are atrophied by neglect. But among the opposing arguments to this theory may be noted the fact that the Esquimaux living on whale blubber, the tropical Oriental with a rice diet, and the savage with his forest nuts, grains, and dried meats, have each and all equally good masticating organs—the difference appearing not in structure, nor liability to decay, but in the abrasion of those which have the most severe use. Food has unquestionably a most important influence upon the dental organs, but the benefits come not in the rejection of soft food and the substitution of hard. Neither is the "bran-bread" theory, which has been so persistently advanced, a much more solid foundation upon which to rest.

Bread made from unbolted flour, or that which contains the husk of the grain, possesses certainly more of the elements which go to make up healthy tooth-structure than where these elements have been eliminated. But mankind do not live upon bread diet alone, it forms but a small part of the bill of fare of the more luxurious classes, and it is very doubtful if the experiment were tried of feeding a family from birth to maturity upon bran bread, they would show any marked improvement in the dental organs, if that were the only means relied upon to produce that result. It savours of the experiment of feeding phosphates into the stomach, in the expectation of thereby making solid bones.

The food theories may be among the secondary sources of decay, but no one of them, nor all combined, form the primary cause of the present increasing degeneration of tooth-structure.

Still another theory persistently advocated by a professional observer, is embodied in the statement that "Contact always produces decay." That teeth frequently decay when they are in contact must be admitted; that they are more likely to decay at such points than in more exposed portions, is also borne out by every observer; but that contact is anything more than an incident to the real cause cannot be shown. If contact be a cause operating independently of other causes, then are we confronted with the fact that a different, but equally independent and potent cause, is found operating upon another surface of the tooth where there is no contact; and, furthermore, an examination of the most solid dental structures ever presented for professional inspection, show all the teeth in absolute contact, and no evidence of decay. This condition is also universally found in the jaws of savage races of good physique.

The contact theory must be relegated to its proper place among secondary causes, and simply a coincident factor in the great problem.

Another theory which has been ably maintained as the sole cause of such vast distruction of dental organs, is the want of cleanliness.

This proposition becomes more forcible when put in the affirmative form—viz., that if the teeth are kept absolutely clean they will not decay.

It is not probable that so simple and so direct a statement, so broad, so comprehensive, and so complete, can be made embodying any other idea, or the different ideas which have been advanced.

It is upon the face of it unquestionably true, and would seem to prove that the converse statement of want of cleanliness was the real cause underlying tooth degeneration. But this is not true. Want of cleanliness is only a factor associated with many others to give it any potency. With all other factors eliminated, it is not at all likely that teeth would ever decay, simply because they were not cleaned.

The cleaning of teeth, as it is now conducted with lotions and pastes, with powders, brushes, and silk, was unknown to the ancients, who were innocent of any thought of such a necessity, and besides we are even now frequently seeing perfect dental structures, which have never known cleanliness as at present understood.

Should we accept want of cleanliness as the sufficient answer to our inquiries, it would

dispose of the necessity of any discussion of the agency of "Electrical Conditions," "Chemical Solutions," "Acid Secretions," "Fungi" or "Parasites," by whatever name they might be called; for whatever might be the agency, external and foreign to tooth substances, which was acting detrimentally, absolute cleanliness would prove the radical cure. Nevertheless, this most plausible of all practical theories is more important in its remedial character than as an explanation of the primary cause.

Each and all the theories thus far noted may be classed among secondary causes, any one of which may have some direct application in certain individual cases, but neither one, nor all together reach the root and foundation of the difficulty.

"Climate influences" is the cause, says another, and still another, "Intermarriage, or the Mixing of Types." These terms, although not altogether meaningless, have probably, in the minds of those who use them, only a vague and indefinite relation to the subject. The more one reflects upon it the less is he inclined to adopt the idea that climatic conditions are anything but a coincidence.

Climate, *per se* cannot, possibly influence directly the disorganization of tooth structure; the changes from heat to cold, from damp to dry, from high barometer to low, do not in themselves affect tooth substance, no matter how frequent or how sudden. Nor does the prolonged continuance of any one of these conditions, with or without any of the others, produce any visible change. The inhabitants of the torrid and the frigid zones have equally sound masticating organs, and so have those of high altitudes, under a prevailing low barometer, as well as those at the sea-side, under the other extreme.

Districts may be malarious to the unacclimatized, and the whole system poisoned, but tooth-structure suffers, if at all, only as a secondary result.

Intermarriage, interbreeding, or crossing the different types of the human race, ought not to result in defective tooth structure. Reasoning from analogy, in the crossing of different breeds of animals improvement should be looked for and not degeneration.

Interbreeding among diseased, deformed, or unsound subjects, carries with it its own antidote, and would very shortly exterminate the race, but the fault would not lie with the principle involved, but with the subject chosen. Interbreeding, in its highest application and essence, involves that only sound and healthy subjects be brought together, and a superior quality, rather than inferior, is the natural result.

While this applies to structure, it may not be equally true of arrangement. The mixing of sound, but inharmonious, types, may result in deformity of arrangement, but not in disorganization or deterioration of structure.

Interbreeding of unsound and diseased subjects with the sound and healthy, is equally a perversion of and an abuse of the principle.

Other vague theories—used, often, without much understanding, but of general application—are formulated as "Constitutional Conditions," "Violations of Hygienic Laws," or "Hereditary Predisposition;" but the most comprehensive of all agencies, and the most intangible withal, which has been made sponsor for this growing curse of the human race, is—"Civilization." What is civilization?—and what has civilization to do with decaying teeth?

Civilization means—out of barbarism, into refinement; out of ignorance, into knowledge; out of bondage, into liberty; out of privation, into comfort.

Civilization expands the intellect, represses vice and savage instincts, cultivates virtue and noble aspirations, encourages the growth of the emotional nature, and enlarges the domain of human sympathy. Civilization includes a life of luxury and ease, the accumulation of wealth, the development of the arts, and the gratification of the appetites and the æsthetic tastes. Civilization defies and controls the elements, organizes commerce, builds cities, railways, telegraphs, and factories, and brings to our vision the most infinitesimal organisms, as well as the mighty worlds of boundless space.

Civilization is the divinely-appointed method through which mankind derive their greatest blessings, and by which they reach their highest possible state of intellectual, moral, and social development. Through civilization is to come the grandest achievements of the race, the possibilities of which are so much greater than have even been conceived, that if now presented to the mind they would be regarded as proceeding only from the Infinite; and only through civilization will the millennial, or ideal, existence of the human race ever be attained.

Civilization, therefore, is a normal condition of mankind, entirely consistent with perfect health and development, and is the agency of evolution from a lower to a higher grade. Nevertheless, while civilization thus contains within itself the elements of the highest attainable finite perfection, it is made the author of nine-tenths of the disorders which now affect mankind. In the rude and barbaric state disease is as uncommon as among the brutes; the sickly and feeble must go to the wall; the fittest only can survive. But with refinement and culture comes enlargement of human sympathy, and the weak and suffering are cherished with fostering care; the sickly child is nurtured tenderly and carefully into manhood, to become the progenitor of a tainted family, and the seeds are sown which bear fruit for generations.

Civilization is not responsible for the disorders of civilized communities; but disease, deterioration, degeneration, and decay, arise from the neglect of, or abuse of, the resources, the agencies, and the products which civilization brings. Crowded communities, filthy abodes, vitiated atmosphere, hunger, privation, and exposure—among the lower classes—breed diseases which sap the foundations of life. But neither of these, nor all combined, tend to produce the disastrous effects which follow the habits and mode of life of the more intelligent, the more wealthy, and the more cultured classes.

The increasing tendency to the degeneration of the dental organs of these days, and which has now become alarming, is exceptional among the lower classes, while they remain in that class; it becomes distinctly marked when, by the accumulation of wealth, they are enabled to adopt the practices of the higher classes, and thus become subject to the same deteriorating influences.

Caries of the teeth is only incidentally connected with the diseases which prevail among a class inured to constant physical labour, whose minds are fully occupied in solving the question of daily bread, and who are content when food, clothing, and shelter are provided. Fevers, inflammations, or epidemic diseases, do not, necessarily, cause teeth to decay. People are constantly passing through these various complaints, and the teeth remain intact. But, passing out of this condition in life, into the more refined and luxurious, we find physical labour exchanged for mental; strain of mind takes the place of strain of body; muscular tension ceases, and nervous tension takes its place; the vices of luxury supplant the virtues of privation; the individual, no longer content with having satisfied his daily wants, enters the struggle to obtain a higher place in the social scale, to accumulate wealth, and to be envied by his former associates.

Refinement and culture create new ambitions, new responsibilities, and new anxieties. Every added anxiety brings an additional mental strain. The mind—and the mind only—is constantly on the alert. The brain has no rest. Nutrition of muscles and bones is diverted to repair the undue waste of nervous tissue; and sooner or later come, inevitably, to parent or offspring, the long list of nervous diseases which now so threateningly confront us. The testimony of the most distinguished neurologists—especially in America—is uniform and undeniable, that diseases of the brain, the spinal cord, and the nerves which issue from them, or the sympathetic system, are alarmingly on the increase. The causes which tend directly to produce such results are more potent, and more active, in the Northern United States than in any other locality upon the face of the globe.

Causes and results which might pass unnoticed in other localities, from their infrequency, are there exhibited in their most pronounced forms; and thus better opportunities are then afforded for the study of these phenomena than anywhere else. The reasons for this (which time will not permit us to discuss) have their foundation, primarily, in the institutions of the country, which permit every one to indulge his wildest political and social ambitions. Add to this, opportunities for accumulating wealth unparalleled in the history of nations, together with the influence of railways, steam printing-presses, and telegraphs—which bring a whole nation into a common bond of sympathy—and we find every excitement, and every stimulus, for the intensest mental activity. For these reasons causes multiply and results develop with far greater rapidity in the New World than in the Old; but testimony is not wanting, that the same thing, in kind, but more limited in extent, is now going on in Great Britain; and even heretofore stolid Germany is developing a like transition.

Decaying teeth and nervous diseases are correlated—each, in a measure, resulting from the otner, and both symptoms of a common cause. Neurasthenia, or nervous exhaustion, is the almost uninterrupted condition of large numbers of the most highly cultivated and most charming people of modern society. I use the term, "nervous exhaustion," not in a positive, but in a relative, sense. Thousands, among the classes referred to, may not show the positive symptoms of nervous exhaustion; but they have, nevertheless, no reserve nervous force.

With watchfulness and attention to their health, and from long habit in a beaten track, they may be quite equal to a systematized daily routine, but any undue excitement, any excessive emotional strain, any unusual physical labour, becomes a drain upon a nervous system without a reserve force which breaks it down, carrying it beyond the point or possibility of immediate recuperation.

Every intellectual faculty developed by civilization, every emotional excitement of a finely strung nervous organization, contains within it the possibilities of the highest enjoyment, but when stimulated to excess or abnormally used, impairs with unerring certainty other bodily functions.

The teeth require as constant nutrition as the muscles, the bones, or any other organs or tissues of the system.

Teeth decay, primarily, because the nutrition of their organic structures being withdrawn, retrograde metamorphosis ensues; and, secondarily, because the agencies born of diverted, improper, or inadequate nutrition, are capable of producing their chemical solution.

Caries is simply solution or disorganization of tooth constituents by agents which are always external, but which would be quite inert under other constitutional conditions.

The vitality of well organized tooth-structure in a healthy body is quite sufficient to counteract the effects of any active external agents which might be temporarily present; but when nutrition is insufficient or diverted, the resisting power of its vitality inadequate, and destructive agents present, the teeth will yield at their weakest points, and caries result.

Herein we find the explanation of many cases which are seen of caries having made considerable progress and then ceased, the causes which produced it having evidently spent their force, or rather the conditions which permitted caries to advance having terminated.

Parents whose teeth are decaying because of diverted nutrition, and exhausted nervous force, transmit, by the inevitable laws of inheritance, this condition to their offspring and it becomes in them constitutional.

Children born of parents whose physical health is barely equal to a continuance of their mental activities, enter the life-race handicapped.

That which was possibly but a temporary state in the parents, which might pass of itself, leaving no trace, or, at least, without serious effects upon the teeth, may become the fixed and permanent characteristic of the child, to be fought against and combated through life.

A child entering life under such unpromising and predisposing circumstances, will almost inevitably show frailty of physique, with poorly organized teeth and a certainty of their early decay.

Unless active and constant effort is made to arrest the result, the steps on the downward grade are as inevitable as mathematical law. Every mental or emotional excitement, every intellectual stimulus in early childhood, only aggravates the inherited and constitutional tendency, and the teeth succumb to destructive agencies which would otherwise be harmless.

The physiological law and its rationale are very simple. Excessive mental or emotional activity impairs digestion and diverts nutrition to the brain to repair undue waste; from lack of nutrition the teeth become degraded, and fall an easy prey to the aggressive agencies generated by the same disordered and defective assimilation.

The organic condition of the tooth, resulting from the want of proper nutrition, is thus the primary cause or essential element, either directly or originally, which gives potency to other causes which are superficial.

Given an unimpaired nervous system, in a sound body without inherited taint, and teeth would never decay so long as that condition was maintained, and that, too, irrespective of climate, peculiar kinds of food, or any external agents which might be present in the natural course of nutrition. Even cleanliness, now considered so essential, would be unnecessary as a preservative of the teeth, and need be practised only for its comfort. We thus recognize the relation and the influence of the many secondary causes, which, by one or another, have been invested with such importance.

The radical remedy for these evils, and the salvation of the race from degeneracy and destruction, would seem to involve a return to a habit of life more consistent with hygienic laws, but in the present irresistible march of civilization, a return to a primitive condition of life would be impossible; but a recognition of, and an adaptation to, a new condition of society is not only possible, but practicable.

A pessimistic view of the future is without reason, for while degeneracy of the teeth is certainly on the increase with certain families and classes, there are equally certain signs of its abatement. With increasing wealth in families comes less care, less anxiety, less nervous strain, more ease, more attention to hygiene, and better habits of life. Destruction of dental organs is arrested in childhood, and transmission of tendency is to a considerable extent stamped out.

The intellectual activity of to-day, the driving energy and intensity of modern thought, is not inconsistent with sound constitutions, with perfect health in all the tissues, and with long life. It is the worry which wears out the nervous system, and not the work.

Civilization, the glory of mankind in their maturity—which has rapidly and largely advanced at the expense of the best life-blood of the race, is, nevertheless, in no wise responsible for the incidental effects which have resulted from a violation of her true principles, for out of civilization ought to, and must come, the grandest examples of physical beauty the world has yet seen, without spot or blemish or taint of disease.

DISCUSSION.

Mr. Spence Bate, Plymouth: It was my intention to have read a paper on "The Tendency to Variation in the Ultimate Structure of the Dental Tissues," but I have

been precluded from want of extended opportunity of obtaining specimens. I have already examined the teeth of man taken from ancient tumuli, but these have been mostly obtained from my own locality, and these I have compared with teeth of the Esquimaux, Flat-headed Indian, New Zealander, and Ashantee, and the examination has led me to the conviction, that both in *form* and *ultimate structure*, the teeth of the recent civilized man have undergone, and are still undergoing, a change. If those friends who may have the opportunity of obtaining specimens of various races, both ancient and recent, will assist me, they will confer a favour and help me in the research.

Mr. Oakley Coles, London: pointed out that the teeth referred to by Mr. Spence Bate, as having remained undecayed for 2,000 years, although they had been the seat of decay during the life of the patient, would again take up the process of decay if they were inserted in an ivory denture and worn in the mouth, thus proving that decay was extrinsic rather than intrinsic in its origin, and depended for its development upon the conditions under which the teeth were placed.

Dr. Magitot, Paris: It appears to be the conclusion advocated by Dr. Kingsley, that dental caries is on a rapid increase. I am far from participating in the opinion, which could only be proved by means of statistics, which are wanting. In reviewing the history of caries in the past, one would infer that it was as freqnent as it is to-day; in the time of the Egyptian civilization I have found the same indications; and going still farther back, we arrive at prehistoric times, where, as is well known, many of the crania present evidence of caries. To explain the frequency or the scarceness of caries in particular parts of the earth, the influence of race must be considered; for it is certain that at the present time many diseases attack certain races more speedily than others, and dental caries is amongst the number. I endeavoured some time since (in a table published in a treatise upon dental caries) to show what has been the part played by race in the distribution of dental caries in my own country.

Dr. George M. Beard, New York, said that he was present by invitation of Dr. Kingsley, that he was not a dentist, but had given much time to the study of the effect of civilization on the nerves, and had treated of it especially in his works on "Neurasthenia and American Nervousness." Dr. Kingsley was sound and verifiable throughout, and he was glad to have heard his paper. It was carrying philosophy into dentistry. (1.) Nervousness was mostly a modern condition. (2.) It was most marked in America for two reasons: (*a*) Greater intensity of life; (*b*) Dryness of air and extremes of temperature. (3.) All the special organs of the body have been reasoned upon in the same way as the teeth, that is, by giving excessive prominence to local and secondary cause. Hay fever, for example, was formerly considered to be local and parasitic, it is now proved to be a constitutional, a functional nervous disease. Nervous dyspepsia also, was once supposed to be purely local, it is now known to be constitutional, and to be treated constitutionally; just as dentists attributed decay of teeth to "sweets," &c., just so physicians attributed nervous dyspepsia to "rapid eating," "ice water," &c. Savages and semi-savages can eat anything in enormous quantities, or go without eating, and they do not have dyspepsia, or bad teeth or rarely; also, they can bear bad air and almost all other evil influences, and be unharmed; their descendants also are unharmed. Alcohol and tobacco do not hurt savages. The temperance agitation is made necessary by civilization. The tendency of evil is to cure itself, within certain limits; and Dr. Beard agreed with Dr. Kingsley, that there would be in the future some improvements.

On the Causes of Dental Caries.

Mr. J. R. Mummery, London.

The question is perpetually recurring.—To what causes are we to attribute the admitted degeneracy of the teeth, and contraction of the maxillary arch, at the present day? Many theories have been advanced upon the subject, but a sufficiently extended and systematic accumulation of reliable data, remains still a desideratum. Nearly twenty years have passed away since I commenced a series of investigations into the conditions of the teeth and maxillæ of the races who have successively inhabited this country, and of the ruder existing races of mankind.

In pursuance of this object I visited, in the course of nine years, every known collection of skulls, between the museums of Netley Hospital, in the south, and that of Newcastle, in the north.

More than 3,000 skulls passed through my hands, but a large proportion were without a reliable history; I selected nearly 2,000, and recorded the results of a careful examination in a tabular form; appending such information as could be attained, from their cemeteries, their weapons, and from historical notices—with reference to the food and social advancement of ancient races in England.

With regard to existing uncivilized races, I have derived much valuable information from military and other gentlemen who had resided in, or had travelled through, countries inhabited by half savage tribes.

In the year 1869 I had the honour of reading a paper upon the subject, at a meeting of the Odontological Society of Great Britain.

With regard to the ancient inhabitants of this country, I found a very striking infrequency of caries, and no instance of irregularity, among the earliest races (whether Palæolithic or Neolithic), who were unacquainted with the use of metals. A marked increase is observable in the tendency to caries in the Celtic race who succeeded them, and whose possession of bronze instruments, and considerable progress in civilization, is proved by evidence from many sources.

After the Roman conquest, the instances of extensive caries and irregularities, arising from contracted jaws, are very frequent, bearing the surprising proportion of ten cases of caries to one case found among the earliest race of people; and we have abundant historic proof of the luxurious habits and advanced mental culture introduced by the conquerors.

The influx of the mighty hordes of Teutonic race, or half savage people of simple habits of life, was followed by a very remarkable diminution in the number and severity of cases of caries, and irregularity of the teeth.

It is generally admitted that civilized life, with its high mental culture, has a tendency to stimulate the development of the brain, whilst the maxillary bones, in the absence of the severe employment of the teeth, in savage conditions of life, suffer a proportionate diminution in size and power.

It should, however, be noticed that destructive attrition of the grinding surfaces of the teeth is singularly prevalent among people, whether in ancient or modern times, whose food is imperfectly cooked, and, consequently, tough or hard, when compared with people of civilized habits.

It would be out of place to occupy the Section by further reference to a paper read some time ago; but it appeared necessary to make a brief mention of my too limited investigations by way of introduction.

The gathering of such an unprecedented number of scientific men at this great Congress, has afforded me an opportunity of enlisting efficient aid in research which

should not be lost, and I offer the following list of questions, proposed for distribution by authority of the Congress:—

1. Have you any opportunity of comparing the teeth of mountain dwellers with those of a kindred race of people who inhabit marshy plains or insalubrious valleys?

2. Have you observed any injurious effects upon the teeth attributable to the impregnation of drinking-water with sulphurous acid gas, in volcanic or in coal-mining districts?

3. Have you any facilities for comparing the condition of the teeth among factory operatives, with those of an agricultural population in a neighbouring district?

4. Have you an opportunity of noticing any especially healthy state of the teeth, and a fuller development of the maxillæ—among sailors, whose diet of hard biscuits and tough meat demands efficient mastication, thus of necessity approaching the habits of uncivilized races, and similarly experiencing destructive attrition?

5. Have you observed, among communities in a similar rank of life, who subsist on a mixed, and often unwholesome, diet, that requires but little mastication—a less favourable condition of the jawbones and teeth?

6. Have you seen any remarkably healthy state of the dental organs among people who subsist upon oatmeal, pure wheat meal, maize, or leguminous food, as compared with those living upon potatoes, or other food, deficient in albuminoid elements?

7. Are you of opinion that the frequent sucking of sweets—especially when combined with citric or other acids—may be regarded as one cause of the increasing prevalence of dental caries?

8. Have you observed any instances of the alleged injurious effect of camphor as an ingredient in tooth-powder?

9. In instances of the emigration of families, who, quitting a highly artificial state of life, have settled in a healthy district or country, adopting simple habits and diet; have you in such cases had the opportunity of comparing the diseased state of the teeth in the elder children with those of the children born under the later, and more salubrious conditions?

10. Have you observed in certain families, who, for a long series of years, have been under your professional care, a progressive deterioration of the teeth, in each succeeding generation?

11. Have you known instances in which the cumulative influence of hereditary disease consequent upon repeated intermarriages, has manifested itself in contracted maxillary arch and extensive dental caries?

12. Have any cases come under your notice which led you to conclude that injury to the teeth may sometimes be traceable to the over-tasking the intellect of young children—seeing that the brain is undergoing its most rapid increase in volume at the precise period of life in which the whole of the permanent teeth, with the exception of the third molars, are in process of development?

A Generalized Treatment of Irregularities.

Mr. Walter H. Coffin, London.

The possibilities of regulating are known, but on any case of irregularity presenting for treatment, the practical question will be, What is the best to do, and what is the best way to do it?

A classification and analysis, in even their infinite variety, of a sufficient number of instances, and the results of their treatment by every possible means, should afford at

least an approximate answer to these and the no less important questions, What not to do, and how to avoid doing it?

The few models shown have been selected as fairly representative from a collection of several thousands, recording the attempted treatment of perhaps a larger proportion than usual of the ordinary irregularities met with in an average practice, and as extending over more than twenty-five years, illustrating the evolution within certain limits of an almost generalized method.

A peculiar system thus developed in use for many years, and now more or less familiar, is no longer a novelty; but as it has been imperfectly made known, for which perhaps its advocates are responsible, and a misconception exists as to its real object, those in whose hands it has been an invaluable aid, feel that some account of what they conceive to be its capabilities and limitations may not be unwelcome.

Classifying any large series, most conveniently by the mechanical exigencies of each case, in certain of them extraction of possibly sound teeth may of course be necessary, though these are somewhat less numerous than usually imagined, and a possible alternative in many instances affords, as shown by casts submitted, satisfactory results.

A large class, uncomplicated by crowding, in which aberrant teeth are easily replaced, admit of direct and immediate correction by suitable means (a simplification of which will be further alluded to). Of the remainder, the majority are cases, of every variety, in which the teeth, not really too large or numerous for the jaw they might symmetrically occupy, are, by some chance of their eruption, irregularly disposed, interlocked and crowded. Of these it may be affirmed quite generally, that rectification necessitates the movement of many teeth, or all, and with their changed positions an altered shape or outline of the dental arch, for any attempted direct adjustment of individual teeth, will be accompanied by such a disturbance more or less extensive.

This will be found to be the chief difficulty of regulating in the usual way, especially with a rigid plate. But in the most intricate, or the simplest of these cases, the permissive control of the general tendency of movement during regulation, reduces their successful treatment to comparative ease and certainty. This mechanical anticipation of favourable conditions may be illustrated by assuming that an incisor has to be moved in a crowded arch by any means applied by a plate, rigidly embracing the bicuspids and canines, when a certain force in a certain time may complete the operation; but if the plate were either abolished, or its two symmetrical halves partly independent and free to move relatively in the plane of the arch, less time and force would suffice; and furthermore, if its two halves tend but slightly to separate by an elastic spring reaction, the operation in some cases will require very much less time and force to be exerted on the tooth. The action thus stated in its simplest form, is obvious from *à priori* considerations, but was observed, it is believed, for the first time, by a singular accident.

Soon after the introduction of vulcanite my father was employing an ordinary plate of that material to move an incisor by the swelling of wood in a dove-tailed notch in the plate. Successive increments of force were resisted, until not only was the tooth quite suddenly in position, but other front teeth were found to be slightly separated, where previously in overlapping contact, the wood which was nearly on the median line by lateral expansion having cracked the plate down the centre. In this instance, as will often be the case, previous "expansion" by the means usually applied, was certainly not indicated, and therefore not resorted to, although just the slight amount of spreading required was prevented by the rigid construction of the plate.

A conviction of this led to a particular mode of treating various irregularities, the adoption of which has been abundantly justified by experience, and which, as anticipating changes common to them, usually expansive, has been called somewhat indefinitely an "expansion treatment."

The troublesome and delicate operation of "expanding the arch," as usually performed, if attempted by the ordinary "jack screw" direct, must be accomplished before other regulating action can be commenced, and may then prove to be either excessive or unnecessary. The screw is applicable with care to severe contraction, though inferior to other means; but undivided plates however thin, and elastic, or hinged plates, however actuated, have not the freedom of movement and self-adjustability desirable, and the screw is entirely unsuitable for a split plate.

The little device my father called an "expansion plate," whether used for direct expansion or not, is intrinsically of extreme simplicity, while of complex regulating action, comprising a means, easily embodied in any plate, of conveniently permitting or assisting, instead of hindering or preventing during regulation, the inevitable changes of the arch naturally accompanying it, and supplementing ordinary expedients with an expansive characteristic.

Its distinguishing function depends on the principle of permitting a relative motion, or maintaining a particular controllable reaction, between two semi-independent parts of it, usually its symmetrical halves.

Any force, however small, is sufficient, if only exerted continuously, with not too rapidly diminishing intensity. Mere repulsion, however, between two points on a split plate is an unstable system, and uncontrollable. Allowing a certain freedom of motion, means must be provided for restraining it, and maintaining by a yielding guidance any desired degree of parallelism.

Difficulties attended the first realization of these conditions, but it is found that a metallic spring of certain form, if a constructive part of the plate, will itself meet all requirements. Trials of the metals and their alloys proved the superiority of apparently so undesirable a material as steel.

Modifications of the arrangement found most convenient and satisfactory are exhibited, some after actual use, others in different stages of construction. The general form may be described as a rather thin ordinary vulcanite plate, capping and clasping some or all of the biscupids and molars, fitting the lingual surfaces of anterior teeth, but divided completely along the median line into two distinct halves, connected, however by a slight steel wire, so disposed that, while guiding and limiting their relative motion, its tension, exerted between them, may be perfectly determined and varied in direction and magnitude.

When necessary in such a plate to establish the spring reaction, a surprisingly small, almost imperceptible stress, even so distributed, and against a wide-spread resistance, if continuously maintained and suitably applied, suffices to produce any degree of motion desired.

The perfection of the model must be insisted upon. An entire plate may fit well and securely, and yet both its halves be so loose when divided as to be useless, while, on the other hand, the halves of a split plate from a good model may be easily fitted, which before division could not possibly be inserted. The best impressions have been obtained with the elastic preparations of gutta-percha or ballata gum, no other material affording with ease the absolute fit essential for a split plate. The peculiarity of gutta-percha, when in good condition, is the physical property at the right temperature of yielding to slow pressures, and being elastic and recoverable to rapid changes, whereby when inserted slowly and removed quickly the most intricate undercuts may be copied, and the slight contraction in cooling just affords enough shrinkage for a thin hard rubber copy to fit tightly. A delicate and elastic vulcanite plate, from a good gutta-percha impression, will generally spring over the teeth with so absolute a fit that its removal may even be embarrassing, but until divided its insertion should not usually be attempted. A good

model should be vulcanized upon direct, and not require to be touched to accentuate undercuts or correct imperfections. The almost insuperable difficulty of satisfactorily tempering bent soft steel, without deformation of shape, was obviated by the use of pianoforte wire, possessing very uniform texture, temper permitting it to be fashioned and used without heating, and a surface hardness and burnish which greatly tend to its preservation. Attempts to coat this wire with other substances were found unnecessary and undesirable. The behaviour of steel to the fluids of the mouth is such that (after certain constructive precautions to be described) if hard and bright at first, and continuously immersed in average saliva, it generally assumes a black polished surface, the smooth, fairly-adherent tarnish being apparently insoluble.

A diameter of between three and four hundredths of an inch, or about 0·035 inch is most suitable, as of this a convenient length of from 1 to 2½ in. exerts an appropriate tension in average cases. The force, varying inversely as the length, may be thus determined within those limits, beyond which a different size is required. The extremities being buried rigidly in the vulcanite, the uncovered and active portion of the wire, emerging from selected points in the alveolar region, should be entirely on the lingual side of the plate, nicely fitting, but free to move upon its surfaces. The wire, between its attachment, may be in a simple curve, when, for localized action (as exclusively posterior expansion), it will urge a relative motion or rotation about some point, but that every kind of motion may be established, one or more reversals of curvature must be made; by either a single couple of opposite curves, or any number of alternately contrary ones, preferably odd, approximately balanced, and as large and symmetrical as possible.

Small bends or angles being avoided, the disposition of the wire may otherwise entirely conform to its most convenient adaptation to the particular plate.

A serviceable form for an upper general expander, is a three or five-curve serpentine figure, like a rounded capital W.

The spring, when in shape, must be free from tension, and attached in the vulcanization to the plate, which is made entire and afterwards divided. The spring being shaped to fit, as nearly as may be, the palatal surface of an upper model, or the lingual surface of a lower, has its ends, for half an inch (without being softened), slightly flattened and roughened, and so bent towards the model as to raise it equally from the surface to a distance of about the desired thickness of the plate, and the portion to be inserted in the rubber, tinned or coated with common solder.

To several points, upon its exposed part, short ends or loops of binding wire are twisted, to better secure it in the plaster investment.

The plate being modelled in the usual way, the spring is placed on the surface of the wax, with its ends buried within, and when removed by the counterpart, protected from the rubber by tinfoil before packing. Finished in the usual manner, entire, the plate is divided with a fine saw, the edges and corners of the cleft being well rounded and smoothed. This, with care, may be done without imparting any tension to the spring, which is important. The plate should be inserted and worn in the mouth without tension for a day or two, to first eliminate causes of irritation not due to its expansive action, and sooner induce toleration of its presence.

Any expansive force required may then be established, and its right direction secured by stretching the two halves, with a slight exaggeration, into the relative positions towards which it is desired they should tend to move. This, however, may require correction and modification by observing its effects in the mouth. The amount of stress, which is not so conveniently diminished as increased, should be small at first, especially in plates whose expansive function may be simply permissive or auxiliary to

other regulating action. It may safely be entrusted to the patient (even quite young) to frequently remove, clean, and replace, after duly cautioning, without fear of disturbing its adjustment.

The experience gained of steel wire has led to its almost exclusive adoption for ordinary regulating purposes, as spring levers acting directly on the teeth for pulling, pushing, or rotating; and being firmly fixed to the plate, their convenience, adjustability, and many adaptations are remarkable.

Combined with a split plate it is found to replace with advantage, screws, inclined planes, wedges, levers, and ligatures, in many of their local uses, and moreover is practicable where nothing else can be applied. In fact, by the gradual simplification of means, and the elimination of uncertain devices, a delicate split plate, with perhaps one or two short lengths of small wire, closely fitting its surface, is often now, to those who use it, the representative and substitute of the wondrous combinations of nearly all the known "mechanical powers" that once exercised their ingenuity. Where, in simple cases, the use of a plate is unnecessary, with an inch or two of steel wire and rubber tube, efficient expedients may often be improvised.

When direct expansion of the arch is indicated, the thin spring reaction plate, fitting closely the palate and tissues covering the alveolus, and not filling the mouth or impeding any of its functions, will, with the minimum of trouble and attention, effect any desired degree of that spreading and moulding of the mouth which it is well known may, to a surprising extent, be rapidly and almost painlessly produced. So easily is this done, that caution must be exercised not to inadvertently exceed the intended results, and the temptation to so readily make room for crowded out teeth, though often with most gratifying effect, must sometimes be resisted. Indeed, the extreme facility and rapidity of general expansion by the split plate, has, in the hands of some without experience of its limitation and abuses, been to the prejudice of the method.

Among the uses of direct expansion, its interesting application to the operative treatment of caries, and to slightly overlapping incisors, may be discussed together.

In young mouths, where interstitial decay of incisors closely in contact almost defies successful treatment, any operation attempted, whether of separating, shaping, or filling cavities, or restoring contour, will of course be facilitated by gaining ever so small a space between the teeth. Paradoxical as it may seem, it is actually less painful and troublesome to secure ample space between all the front teeth at once, than to wedge two of them apart in the ordinary way; with the advantage of easily maintaining their separation, without irritation, during any course of treatment.

A plate exerting anterior expansion will rapidly, and usually, almost painlessly, separate the incisors, and by a suitable adjustment of the bearing surfaces may readily be caused to distribute spaces equally between all the front teeth. Their slight tenderness soon disappears if held by the same or another plate, and they may be kept apart without fear of their not coming together again. In cases of nerve inflammation, caution will suggest itself, but an accident has not occurred from that cause. Models are submitted of this effect. If the incisors are overlapping, slight expansion, with just suitable disposition of the bearing surface afterwards, usually permits the natural action of the lips to straighten them.

In some of these cases it may be necessary to partly maintain the expansion of posterior teeth by a suitable retaining plate exposing their articulating surfaces till the bite is re-adjusted by those of the other jaw accomodating themselves.

Where the expansion in one jaw is considerable, the correction of the bite may require a slight mechanical expansion of the other, which for this purpose, and assisted by the articulation itself, is easily attained. Expansion, where posterior teeth wrongly

articulate, presents little difficulty when the conditions are symmetrical on both sides; when otherwise, or confined to one side only, a differential or even a unilateral effect may be produced, according to the number and kind of teeth the action of the plate may be distributed or concentrated upon, and the arrangement of its articulating surfaces. In differential expansion (which may occur unexpectedly), the relative motions appear disproportional, that is, seem to vary (inversely) more than the estimated resistances.

Lastly, the obvious application of expansion to narrow misshaped mouths with high contracted roofs, unfortunately also presents the greatest difficulty. Many of these cases admit of very great improvement, as illustrated by models exhibited, where circumstances are favourable for expansion, as when the bite can either be kept normal or made so, and the jaw is not really as contracted as the dental arch makes it appear, but these must be treated with caution. In several cases accompanied by prominent incisors, after only slight posterior expansion, considerable spontaneous recession of the incisors has occurred, probably by the action of the lips, before any special mechanical means were employed. In the models of some cases treated will be observed the profound alteration in shape the palate vault appears to have undergone. Inflammatory symptoms observed along the median line corresponding to anatomical relations, but possibly caused by the edge of the cleft plate, have suggested certain bone disturbances, but though the extensive damages seem otherwise almost inexplicable, interosseous action can only be conjectured. While expansion is most readily performed in young mouths, especially under sixteen, the only limitation in age would seem to be the diminished power of restoring fixity after movement which must be inferred of advanced age, though in a case of considerable expansion at forty-five, the teeth became perfectly firm afterwards. It is hardly necessary to dwell on the desirability of the greatest simplicity of regulating devices, in principle and details, and the self-maintaining adjustability of plates, that they may be as independent as possible of any control by the patient, whose co-operation should be confined to maintaining their perfect cleanliness only, and the health and comfort of the mouth. But it may, perhaps, be pointed out, that greater beauty and finish of plates than is customary, is not without effect in assuring care and attention to their good condition by arousing interest in their perfection. Great credit is due for working out certain details of expansion plates, to Mr. Peter Headridge, of Manchester, for many years assistant to my father. This gentleman even obtained a patent for some constructive particulars, which he very advisedly allowed to lapse. The curious are referred to Specification 1101—1869. In final justification, the advocates of means that simplify, extend, and may revolutionize the treatment of irregularities, appeal to the records of their results, as matters of fact, with the conviction that, whatever their real importance or value may be, they would have been difficult or impossible to otherwise attain, and venture at such length to detail their procedure in order that their conclusions may be confirmed or criticized by others.

DISCUSSION.

Dr. Rosenthal, Liège: Fearing that the method of Mr. Coffin may not be appreciated, I feel it my duty to communicate to you, that eight years ago Mr. Coffin explained his method to me, since when I have employed it, with a success that I had never obtained so easily by the methods that I had formerly employed. I have been able to undertake my cases without having recourse to the extraction of sound teeth; besides, his theory is correct, most irregularities proceeding from the narrowness of the dental arches, which his apparatus enlarge, so that the teeth come into position naturally. I find it easy to carry out, rapid in its results, and but little distressing to the patient.

Causes of Irregularities of Position of the Teeth.

Dr. Thomas Brian Gunning, New York.

Gentlemen,—I premise that after deciding to offer this, and when looking into what had been done in the past, I found, in the *New York Dental Recorder* for 1847, a translation of the "Reflections of M. P. A. Grandhomme, on the Methods used in Regulating the Teeth," and, to my surprise, I saw that, before 1840, he had, in Germany, practised the regulation of the teeth as soon as they appeared, and by means of a new method, which was, in principle, the same as that now used by myself. To his arguments in its favour, and in condemnation of the ligatures, metal straps, &c., even still in common use, there is little to add. His experience dated back at least to 1828, when he made the numerous apparatus offered in that year, by Professor Carabelli, to the University of Vienna, intended to illustrate the subject. He criticized, most intelligently, the methods of M. Catalan, M. Delabarre, and M. Desirabode; and condemned the adjustment of teeth by forcible luxation, as introduced by M. Oudet. His views were published in Paris, in 1845, and translated as above, by Dr. E. Baker.

I agree with this cultured writer in his estimation of the importance of this branch of practice. I, however, differ with him in his rejection of M. Grandhomme's early reduction of irregular positions of the teeth in children. I have long practised this, and supposed myself to be the first who had written in favour of it, until, as above, I came across M. Grandhomme's able presentation of the different methods known in 1845. Since that period practitioners have had for their guidance the investigation and discoveries of Owen, Nasmyth, Goodsir, Tomes, Saunders, Lintott, Cartwright, Mummery, and others; and, in this kingdom at least, the great advantage of association with those in the other branches of medical science in renowned hospitals and dispensaries.

But their most trusted teachers and writers upon "Irregularities of the Position of the Teeth" ignore the facts of Nature, and teach others to work, not only outside of, but in opposition to, her processes.

This paper cannot consider the special traits in the jaws of different races or nations, nor attempt to account for abnormal conditions which are hereditary or congenital.

Discussion upon irregularities of the teeth which result from fault in the jaws will be more useful when remarking upon the features it is desirable to improve, and showing the means to accomplish it. This, especially, as the relations of the jaws to the teeth and their alveolar processes will be explained, because they are not only imperfectly understood, but misrepresented, it being asserted that the jaws are developed in advance and independently of the teeth and alveolar process, and that these may be removed without affecting the jaws.

Normal growth is sometimes interrupted by disease, which checks nutrition, and parts may be lost by necrosis, or adhesions form which obstruct the movements of the lower jaw. The limits of this paper, however, prevent remark upon these lesions, except to say that mere stretching will not release the jaw; the knife, saw, &c., must be used; and if a false joint is required, it should be made, if possible, in the ascending ramus, about one-fourth down from the top of the condyle to the angle; thus the external pterygoid muscle of the other side will depress the jaw readily.

At the seventh week of fœtal life the germs of the teeth begin to start from the mucous membrane, which lies between folds somewhat firmer than itself; and by the thirteenth week the papillæ of all the deciduous teeth are enclosed in open follicles. At the fifth month, the germs of the ten anterior and of the first molar teeth of the permanent set start; and as the deciduous teeth with the sacs of the ten permanent ones grow, and take up more space, the permanent molar is forced into the tuberosity of the

upper jaw, or into the coronoid process of the lower. They occupy these positions until the eighth or ninth month; during these two months, the basilar portion of the lower jaw, which supports the alveolar process and teeth, and also gives attachment to so many muscles, is rapidly developed; yet at birth it is comparatively incomplete.

In nursing, the upper jaw is supplemented by the lip, the nipple being held against the roof of the mouth by the stronger and more active lip, assisted by the less-developed jaw. This keeps the lower jaw back, and the upper jaw projecting, in accordance with the earlier development of its teeth in fœtal life. In general, the central incisors of the lower jaw appear first; but when those of the upper come, they are soon joined by their lateral neighbours, the lower lateral incisors emerging later from the jaw, which is still without bony union at its symphysis. Thus, the lower teeth are kept back inside the upper. The lower jaw is more easily observed than the upper; it is, therefore, referred to in preference.

The deciduous set of teeth which begin to appear about six months after birth, are by three years of age arranged in the mouth. At six years the lower jaw is seen to be much deeper and larger in every way, as it holds the temporary set of teeth and also the permanent, so far as developed.

The jaw generally lengthens until three large molars have come through on each side behind the semicircle which held the deciduous set. The third molars come down like the second and first molars into the dental range, the horizontal portions of the jaw growing an inch or more in front of the ascending ramus in the lower jaw, and an equal length in the upper jaw.

It is apparent that from the start the vital force is specially exerted to perfect the teeth, and form the jaws for their protection and arrangement in the mouth. The alveolar process develops with the teeth, and the basilar part of the lower jaw, which grows rapidly just before birth, continues to enlarge in proportion to the development of the teeth; this is shown clearly in its growth to admit the permanent molars.

Now all this change of the jaw from before birth until adult life is in connection with the development and arrangement of the teeth; and enough has been shown to prove that the growth of the jaws is generally controlled by the development of the teeth.

It is now necessary to inquire how the jaws are affected by the loss of the teeth; for if the jaws are out of proportion, one, especially the lower, may be too large or otherwise deformed. From a short time after birth, even with both jaws normal, conditions may arise which tend to deformity, but they are so well known as to require no special explanation. The permanent front teeth, when about to replace the temporary ones, are packed in the alveoli and in a somewhat smaller circle than the roots of the deciduous teeth; therefore the central incisors of the lower jaw come up to the back of the deciduous incisors with their mesial sides projecting, and their distal sides kept back by the unshed laterals; the permanent laterals come with their distal sides projecting, the mesial resting behind the centrals; and the canines come up outside and turn in the laterals which turn the centrals into range. This is when the parts are regularly developed, and the deciduous teeth shed naturally. If the infant teeth are lost too soon, then the permanent centrals may be turned out too much by the laterals, and the last turned in too much by the canines. This, however, is not the whole injury; for the cutting edges of the incisors will project forward too soon, and develop their roots towards the inside of the jaw, instead of forming their alveoli in a larger circle nearer to the front of the mental process. Again, the growing permanent teeth are not so likely to expand the parts as when assisted by the deciduous roots. The effect of premature loss of temporary teeth is proved by loss of the deciduous molars; a bicuspid grows between the roots of each, and if these roots are lost early, the bicuspid teeth

are not wide enough to keep the large molar back. Now this forward movement is common to all the permanent molars while anyone of them is still up behind the dental arch; they often crowd the bicuspids, and make even the lateral incisors close too much on the centrals.

When the way is open to them through early loss of the teeth, they develop and come into range sooner; and in proportion as they find room forward, their alveoli require less growth of the basilar portion of the jaw in front of the ascending ramus. It is thus clear that loss of teeth contracts the alveolar process, and also tends to shorten the jaws.

I submit two examples, one, which originated before birth, shows defect of jaw from a want of teeth; the other, lateral deformity through the loss of a tooth from one side only. The first was taken from a boy fifteen years and a half old; only seven teeth of the infant set were in the upper jaw, the lower had ten; but in both jaws the incisor teeth were pointed. No permanent teeth had developed, nor were there any indications of their being in the gum. The upper jaw was very small. His mother thought the deformity was caused by a fright she received from an animal. The boy's health and intellect were good. I lost sight of the case over twenty years ago.

The second case is that of a patient eighteen years and a half old, who had the right lower permanent first molar extracted when between nine and ten years of age.

In May, 1877, I began to widen the roof of the mouth, between the bicuspids, to remove the pointed form of the upper jaw; this was accomplished by December.

The fourteen upper teeth then articulated well with the thirteen lower, but during the last three years the lower wisdom teeth have enlarged the jaw, so that the lower teeth project outside the upper all around, but more so in front where the jaw is out of centre, the chin being a quarter of an inch over to the right, through the left wisdom tooth getting room to come down by the growth of the jaw; while on the right the wisdom tooth came into the place of the second molar that had moved forward to the bicuspid, the jaw not growing so much on this side which lost the molar. The wisdom teeth are even with the second upper molars, while the left lateral incisor is up to the division between the upper centrals; there is as yet no indication of the upper third molars. The jaw is firmly jointed in the glenoid cavities, the left angle is out a little, but the great deformity is in front.

In these anatomical and physiological condition and processes, we should seek for a way to counteract the abnormal departures; and the way to modify the relations of the jaws and teeth will be still more apparent, after some suggestions as to the effect of premature loss of the deciduous teeth upon the position of the permanent set, and some remarks upon the effects of diseased teeth. These suggestions are made more particularly to aid in the selection of appliances.

As the lower permanent teeth usually appear before the upper ones of the same class, so the expansion of the lower jaw is somewhat earlier than that of the upper. Consequently in the time between the completion of the first set and the appearance of the six-year-old molars, the lower jaw may grow too large, and its incisors strike on the edges of the upper front teeth, and this so that it is uncomfortable, and in order to rest upon the back teeth the muscles in such cases hold the jaw and the front teeth forward. Or the jaw may be held out through the too early loss of its infant incisors, allowing the permanent ones to get in the way, and they are held in front for comfort.

Now when an infant tooth remains too long unshed, the permanent one may be kept out of range, and the jaw even be misplaced by it; this should be corrected, but as the alveolar arch will not be diminished in front, nor encroached upon behind by the molars, to extract unshed teeth and bring their successors into place is but a simple matter, con-

pared with the trouble caused by want of room through the too early loss of infant teeth allowing the permanent ones to develop the points of their roots backward into a smaller circle. The forward action of the lower jaw may also commence through a tender front tooth of either jaw; or if a side tooth is painful, the muscles may hold the jaw out of centre, and it may grow deformed, or its joints with the glenoid cavities may alter and permanently displace it. This deformity is also occasionally quite convenient for the time, where the abnormal position of the jaw gives a more comfortable position to the teeth; so that when the jaw moves out of centre, it brings its teeth on one side more in articulation with those of the other jaw.

Thus in 1865 I was called to a patient sixty-two years old, whose jaw had for years been held out to fit his teeth. He was now under treatment for fracture through the neck of each condyle, having fallen on the curb-stone, so that his jaw was driven back and the overlapping teeth snapped off. The bandages were removed, and the jaw proved to be unbroken.

In a child which has been fed by the bottle, or which has a habit of sucking its tongue or finger, we frequently see projecting upper gum and teeth; this displacement should teach us that teeth may be moved early, and that they need not be left out of place until firmly held by their full grown sockets, as is generally practised. The teeth press each other into or out of regular position, without causing pain or injuring each other, and if, when cutting the gum, they are out of place, they may frequently be made to regulate themselves by the use of proper appliances while growing.

At any time after four or five years of age, a rubber plate which fits and covers the teeth of the lower jaw, running down on the gum inside somewhat, will restrain undue enlargement, while, with appropriate projections above, the upper teeth will keep the lower teeth and jaw in place. It will do this by retarding the growth of the lower alveolar arch, and perhaps by spreading the upper teeth, and it frequently breaks up a temporary holding of the lower jaw out of position, which if left alone might cause permanent distortion.

A lower incisor often comes with its cutting edge turned, so that it will be pressed more out of range when the next tooth appears. This can be corrected by letting it grow into a channel cut in a plate such as just described, or in a mere skeleton plate, which allows the tops of the teeth to appear and strike the upper ones as usual. In this way, or a modification of it, the tooth may be put in place before the next is so far up as to block the way. This is but a simple following of what is often seen in the gums when a piece of an old root, &c., turns a growing tooth out of line.

In cases of projection of the lower jaw, caused by muscular action drawing the condyles toward the eminentiæ articulares, a plate, which projects out from under the upper incisors down in front of the lower, will generally press the jaw back, and, at the same time, it may be used to correct the positions of the teeth which caused the jaw to come forward. Or, if required, a plate on the lower teeth will throw the jaw back.

A projecting jaw, which is well seated in the glenoid cavities, cannot be pressed back by any apparatus in the mouth, nor by any outside around the head and jaw, whether as pictured in the books or otherwise. If the condyles were pressed back from their natural position, the ears would be closed.

In families with a tendency to long lower jaws the children should be carefully watched, for much may be done to modify the relations of one jaw to the other, and of each to the teeth within it, by carefully discriminating between teeth to be extracted and those to be saved, especially if observation is afforded in early life, and operations are made to conform to what is indicated by the quality and condition of the teeth, in connection with their relative value, and in respect to hereditary tendencies.

Except for the relation between the teeth and jaws, and for the changes which are usual to them in the earlier years of life, the most intelligent treatment could be of little avail in preventing or in remedying malformation.

The fact that when the teeth are lost the jaws are still able to act in functions other than mastication is no justification of the misleading statement that the teeth and jaws are independent of each other.

If the teeth, as a whole, are too large for the jaw, they should be kept in to encourage the growth of the jaw, as long as this can be promoted, and then such of them extracted as can be best spared to make room for the others. If a jaw is too large prospectively, remove the necessity for its growth, whether in the least important teeth, or in their position, and especially guard against habits which tend to this deformity.

If irregularity be treated by appliances, they should act naturally; those just described press the teeth either through their own growth, or similarly; when the jaws close, they give the shock usual in natural movements, but upon the intervening appliance. Thus, if the teeth are moved, they are never lifted from their sockets. The teeth, as a whole, support each other, or are affected naturally, and are not moved unnecessarily in other functions. This is especially so with these regulating plates, they having gold hooks imbedded in them, and being used without anything more elastic than hard wood, which drives each tooth by direct pressure; in this way the apex of its root is carried out with its crown, especially in the lower incisors and the upper laterals, whose thin roots move readily in the alveolar process, when their crowns are held back by the adjoining teeth, or their cutting edges restrained by gold hooks.

Dental practitioners enjoy, at this time, great facilities for the manufacture of their various contrivances, while periodicals and books are numerous, to which they may refer, and in which many have shown their peculiar methods; but careful scrutiny gives no assurance that they regulate teeth any better than men of good standing and skill, in Germany and other parts of Europe, fifty years ago.

On the Origin and Treatment of Certain Forms of Irregularities of the Teeth.

Mr. J. Oakley Coles, London.

In my classification of the deformities of the upper jaw I have endeavoured to establish the theory that a large number of cases of irregularities of the teeth are due to a malformation of the jaws, rather than to a mere displacement of the dental organs. In other words, I have asserted that the arrangement of the teeth is but the expression of a profound morphological change. In continuance of my investigations in this direction, I desire to call attention on the present occasion to that variety of the brachoid jaw in which the region of the bicuspid teeth is the seat of lateral compression. It is a fact that will scarcely demand proof or verification, that at birth all upper jaws are normal in size and outline. At this date the antra are little more than rudimentary, and occupy but a small space between the base of the alveoli and the floor of the orbit. The intermaxillary articulation is generally normal in character, and the position of the lower jaw in relation to the upper rarely affords any evidence of the changes to which they will afterwards be subjected. Whatever may be the influence of heredity, such influence finds expression during the period of growth, rather than that of development, and structural and functional derangements are manifested and intensified chiefly at a date subsequent to the shedding of the deciduous teeth. In the perfectly healthy subject the face and jaws will have arrived at a normal state of development at about the age of

puberty. The features of the face will have become permanently marked out by the gradual growth downwards and forwards of the upper maxillary bones and adjacent structures. The chief factor in the production of these results is the growth of the body and wings of the sphenoid. By the agency of this bone the intermaxillary region is carried forward, and space provided, posteriorly for the increased length of the true maxillary processes. The two glenoid cavities become more widely separated from each other, and the direction of the long axes of their articular surfaces and of the corresponding condyloid processes of the lower jaw become subjected to important modifications. During the time that these changes are taking place, the antra will have become considerably increased in size by the lengthening, in a vertical direction, of this portion of the upper maxilla. Although the maxillary sinus may vary in capacity from one to eight fluid drachms, it should still physiologically bear a definite relationship to the facial angle. To compensate for the advanced position of the maxillary bones, the palate bones grow in such directions as to fill up the gap that would otherwise exist between the posterior extremity of the dental arch and the pterygoid processes of the sphenoid. If all the parts involved in the formation of the upper and lower jaws have grown in proper proportions to each other, the teeth will only be subjected to such forms of irregularity as may arise from some purely mechanical condition confined to the normal area of the dental arch. If, on the other hand, the jaws themselves have been subjected to any irregularity or inequality of growth, the entire dental arch will be the seat of well-marked deformity, and the teeth themselves be but an integral, and not independent, element in the production of the conditions we are discussing; or, to put the case in another way, the teeth are in the one instance the cause of the dental irregularity, whilst, in the other, they only give expression to a general maxillary deformity in which they are involved. For the purposes of the present paper I now wish to call attention to that form of brachoid jaw in which the bicuspid region gives evidence of lateral compression, rather than of lateral expansion. In such a case the six front teeth are crowded together, whilst the second bicuspids are implanted, in a severe example, with but a space of five millimetres between them in the transverse direction. The first bicuspids, although inside the dental circle, are not so seriously disturbed. If the deformity has been allowed to progress unchecked until 21 years of age, the grinding surfaces of the bicuspid teeth are frequently on a lower horizontal plane than the remaining dental organs of the upper jaw; or, in other words, in the case of the four bicuspids, we may say that the bite is raised.

The external alveolar wall will show compression corresponding to the teeth as measured from side to side, and in a well-marked case pass vertically upwards, or even outwards, towards the level of the floor of the antrum. In many instances, the lower jaw will be of unusual dimensions, not merely in comparison with the upper maxilla, but also in comparison with a normally developed jaw at the same age. The interdental articulation is, of course, destroyed, but beyond this the horizontal rami and body are unusually thickened, and at both the alveolar and inferior borders present a curious thickening and rounding. The inferior dental arch passes outside the superior dental arch at all points. The mental outline is almost rectangular; whilst the outline of the ascending and horizontal rami are generally obtuse-angled. The soft palate is generally short, as measured from the posterior wall of the pharynx; the vortex of the hard palate is apparently above the normal plane; and the tonsils are almost in every case considerably enlarged. Externally the face presents certain well-marked and characteristic appearances. There is a peculiar flatness and squareness from the root of the nose to below the mental eminence, which I can only describe, in the language of an artist, by saying that there is an absence of drawing in these parts. The lines produced by

the muscles passing from the superior border and angle of the orbicularis oris are not as strongly indicated as they should be, and the face generally is noticeable as being devoid of those lines which are generally regarded as myological landmarks. The nose is usually small, whilst the forehead, with the remaining frontal outlines, gives a good facial angle. The cause which I venture to suggest as an explanation of the origin of this deformity is the irregular and excessive growth of the external wall of the antrum on either side.

From the fact that the transverse measurement of the second bicuspids normally corresponds with a similar measurement between the posterior deciduous molars, it is manifest that in the cases under consideration, where we find the second bicuspids within five millimetres of each other, that this region must not only have failed to preserve the outline presented in the infantile arch, but must also have been subjected to very considerable mechanical forces during that period of growth in which the antra have become developed to their normal size. I have before alluded to the influence exercised by the body and great wings of the sphenoid, and to the operation of the latter in carrying back the condyloid cavities, and with them the condyles of the lower jaw, and to this we must I think attribute its abnormal size. Whilst in the evidence afforded by the texture of the hair, teeth, and nails, as well as the enlarged tonsils, we may assume that strumous condition of the constitution which is generally held to explain the development and irregular growth of the cranial and facial bones, Professor Humphreys has observed that the prominence of the forehead is proportionate to that of the chin, and that the antra in negroes are small, and bear a definite relation in size with the angle of the face. It is, therefore, not unreasonable to infer that in the cases we are discussing, in which the frontal bones are vertical, and the mental region of the lower jaw correspondingly, if not abnormally developed, that the antra should be abnormally large.

My clinical observations do not at present permit me to discuss the relationship between the enlarged tonsils and the increased capacity of the maxillary sinuses, but I trust we have present with us on this occasion those who may be able to contribute to our knowledge on this important point.

In connection with the subject of the influence of the superimposed structures on the dental arch, I have elsewhere endeavoured to show that the prominence or diminished size of the intermaxillary region is due to either the increased or diminished force exercised through the vomer by the body of the sphenoid; and a case under the care of my friend, Mr. Rose, of double hare-lip and cleft palate that had remained unoperated upon till the patient was thirty-five years of age will afford corroboration of the soundness of this theory.

The accompanying diagrams show the long and well-arched nose, and the intermaxillary bones carried forward with the rest of the nasal septum; and this affords very strong evidence in favour of the assertion that intermaxillary prognathism is the product of excessive growth of the sphenoid operating through the vomer. In the Museum of the Royal College of Surgeons (Teratological Section, 238), there may be seen an interesting specimen, illustrating the peculiar form of the walls of the antrum and upper maxillary outline, that I believe we may find in the compressed brachoid arch as well as the enlargement of the lower jaw, to which I have already referred.

In a paper read before the Royal Society of Edinburgh, some twelve years ago, by Dr. Smith, some inter-bicuspid measurements were given of a series of cases of congenital cleft palate; and the author of that communication attributes the lateral compression in such instances to "a misdirection of growth dependent upon the absence of the mesial structures, while the superior maxilla is becoming as age advances elongated downwards by the expansion of the antrum." At that time, I dissented from such a conclusion; but

my later investigations have induced me to think that Dr. Smith was right and I was wrong, and I gladly avail myself of this opportunity of saying so. And it will be seen that I have adopted the same explanation for the origin of the compressed brachoid arch. Time will not permit me to enter at any length into the question of treatment, and I would submit the following point:—

(1) That if expansion is tried it should be expansion of the jaw with the teeth *in situ* in the first instance, and regulation of the teeth individually as a subsequent operation, rather than expansion of the dental arch by pressure applied to the teeth and their alveoli. (2) And next the desirability of extracting the teeth that are out of position, and then restoring the contour of the arch by expansion. This treatment, of course, applying only to the more severe cases.

I am induced to bring this point forward for discussion, as there seems to me the danger that we may, in the pride of our professional skill, submit our patients to greater pain and risk by saving the teeth than by extracting them.

Illustrative Skizzen zu Carabelli's "Mordex prorsus" und dessen Verhältniss zur sogen. "Prognathia ethnologica" und Meyer's "Crania progenæa."

Dr. Joseph Iszlai, Buda-Pesth.

Zweifellos sind allen Zahnärzten und Anatomen diejenigen teratologischen Formen der Zahnreihenschliessung, oder des sogenannten "Bisses" bekannt, bei welchen während einer zwanglosen Aneinanderlagerung der beiden Zahnreihen, das Vordertheil der oberen Reihe übermässig weit vor das untere Vordertheil zu stehen kommt, oder andere derartige, weiter unten näher zu beschreibende Unregelmässigkeiten wahrzunehmen sind. Es sind diejenigen Zustände, welche Carabelli, mit Einschluss selbst eines mässigen Vortrittes der unteren Vorderreihe vor die obere, in seiner "Anatomie des Mundes," S. 133, unter dem Namen "Mordex prorsus" zusammengefasst hatte.

Diese Benennung ist jedoch in der Odontiatrie und überhaupt in der Odontologie nicht heimisch geworden, insofern man kaum in irgend einer anderen Fachschrift sie wiederfinden kann. Dafür werden öfter die verschiedenen Hauptarten der, durch Carabelli zusammengefassten Zustände, getrennt durch besondere Namen in den betreffenden Nationalidiomen, oder auch ohne Specialnamen durch blosse Umschreibung bezeichnet.

Ich will nun im Nachfolgenden zu erörtern versuchen, wie weit die Umschreibung der Carabellischen, als auch die anderen, litterarisch in Verwendung gekommenen Ausdrücke und die, an sie gehefteten Begriffe, den theoretischen und praktischen Fachwerken entsprechen.

Was die Umschreibung anbelangt, so kommt es allerdings in den verschiedensten Doctrinen, und auch in der Odontologie vor, dass einzelne Specialitäten, wenigstens bis jetzt, keine eigene Benennung erhalten haben. Dies kommt aber meist nur bei nicht häufig figurirenden und weniger wichtigen Gegenständen vor. Wenn nun doch hie und da eine Ausnahme hievon entdeckt werden kann, so ist das meiner Ansicht nach eben ein Zeichen dafür, dass ein solcher Gegenstand bis jetzt nicht ganz gebührlich verarbeitet worden ist. Es wird doch wohl einem jeden, der sich mit irgend einem wissenschaftlichen Gegenstande intensiver befasst hat, genügend bekannt sein, wie sehr die Unstetigkeit der Bezeichnungen und die Präcisionslosigkeit der, daran geknüpften Begriffe, die Handhabung eines solchen Gegenstandes, wenn nicht geradezu verhindert, so doch zum Ueberfluss

langwierig macht und sogar die Aneignung desselben, besonders für jüngere Studirende, bedeutend erschwert. Bei der mir gewiss scheinenden Wichtigkeit des gegenwärtigen Themas, ist also meiner Ansicht nach eine blosse Umschreibung der betreffenden Specialitäten ohne wohl definirte Nomenclatur ungenügend. Wir vernehmen doch auch Kingsley auf S. 28 seiner "Treatise on Oral Deformities," welche in mannigfacher Beziehung zu meinem gegenwärtigen Thema steht, folgenden Satz, sichtlich im Bedürfnissgefühle, mahnend ausrufen: "In entering upon an investigation of this kind with a view of demonstrating a fact in science, it is of the utmost importance, that there be no ambiguity of language or terms."

Es ist eben ein Merkmal des Fortschrittes, dass bei ihr, nebst der immer mehr specialisirenden Objectforschung zugleich auch in der Klärung und Präcisirung der Begriffe und deren Nomenclatur eine immer mehr vervollkommte Correctheit, besonders in jedem solchen Fache, welches in irgend einem Grade auf Wissenschaftlichkeit Anspruch haben kann und will, angestrebt und bemerkbar wird, wobei bezüglich des Ausdrucks mit Rücksicht auf die internationale Natur der Wissenschaften überhaupt ein Streben nach—wenngleich hie und da etwas barbarisirtem—Altclassischem, meiner Ansicht nach nur erwünscht sein kann, denn dadurch gewinnt man zugleich an Sicherheit der Namenstabilität.

Derartige Erwägungen ermunterten mich das, im Titel bezeichnete Thema, vor ein internationales, als besonders in solchen Angelegenheiten competentestes, Forum zu bringen, indem ich hiemit meine diesbezüglichen, meist unabhängig eigenen Ideen vorzuführen, und dadurch wenigstens zu weiteren, perfecteren Parallelarbeiten anzuregen trachte.

Um nun auf unser Thema zurückzukommen, kann ich angeben, dass ich unter den Ursachen, welche die erwähnte mindergünstige Aufnahme der Carabelli'schen Auffassung und Nomenclatur bedingten, die drei folgenden für die wichtigsten halte.

1.—Nach S. 134 des erwähnten Werkes, war Carabelli in dem Irrthume befangen, dass immer eine blosse Vorwärtsneigung des vorderen Alveolartheiles, d. i., besonders des os intermaxillare die Ursache seines oberen oder beide Kiefer betreffenden "Mordex prorsus" ist. Nun wurde und wird aber bei weiterer Prüfung der Sache immer gefunden, dass ein solches Vorstehen aus verschiedenen Zuständen resultiren kann. Die vollkommene Auseinanderhaltung dieser Ursachen aber ist trotz einer erkannten solchen Nothwendigkeit bis jetzt nicht durchgeführt worden, wie aus dem Weiteren erhellen wird. Die Nichtbefolgung einer absoluten Auseinanderhaltung führt noch jetzt zu mancher irrthümlichen Auffassung und führte Carabelli zur Vermischung teratologischer Zustände mit normal ethnologischen.

2.—Da Carabelli einem solchen Inbegriff der als "Mordex prorsus" bezeichneten Zustände in seinem "Mordex retrorsus" nur zum geringen Theil entsprechende Gegensätze entgegenstellt, so fehlt dabei der symmetrische Antagonismus der Begriffe.

3.—Das Wort Mordex selbst wandte Carabelli nach seinem eigenen Geständnisse nur mit einer gewissen Licenz an, wie dies aus seiner Bemerkung auf S. 126 l. c. ersichtlich ist. Sollte auch "Mordex" wirklich Gebiss bedeuten, so muss nach der moderneren, präciseren Auffassung nicht für die Specialität des ganzen eigentlichen Gebisses, sondern nur für die Art der Aneinanderpassung der beiden Zahnreihen, und zwar besonders ihrer Vorderparthie, ein möglichst internationaler Ausdruck gesucht werden, was ich weiterhin bei dieser Gelegenheit zu erstreben trachte.

In Wedl's Auffassung dieser Angelegenheit findet nach seiner "Pathologie der Zähne" die Carabellische Idee selbst gleichsam nur eine Bestätigung, nur meidet er hierbei die Carabellischen und überhaupt die altclassischen Bezeichnungen, und sondert den "Mordex prorsus" Carab., natürlich auch nur durch Umschreibung, in drei Arten.

Im übrigen fügt er den, von Carabelli aufgestellten Specialformen—abermals nur mit umschreibender Bezeichnung—zwei andere bei, nämlich das "vorn abgeplattete" und das von Professor Langer in Wien beschriebene "unten zu weite Gebiss."

Um nun einen umfassenden Ueberblick des heutigen Standpunktes dieser Angelegenheit zu gewinnen, will ich auch einige andere, diesbezüglich erwähnenswerthere Auffassungen anführen, nach welchen nämlich die, von Carabelli zusammengefassten, Zustände schon mehr gesondert werden, und da ich schon mit den ebengenannten deutschen Autoren begonnen habe, will ich zunächst mit den, in deutscher Sprache vorhandenen Systemen fortfahren.

Mühlreiter lehnt sich zwar mannigfach an den Carabelli-Wedl'schen Standpunkt an, bringt aber dadurch eine klarere Uebersicht in sein System, dass er den Mordex retrorsus von Carabelli gänzlich eingehen lässt, welcher unter andere, hauptsächlich unter die "geraden Gebisse" sich eintheilen lässt, und mit dem Namen "rückstehendes Gebiss" (was lateinisch "Mordex retrorsus" wäre), diejenigen Fälle des Carabelli'schen Mordex prorsus bezeichnet, bei welchen die untere vordere Zahnreihe vor die obere tritt; seine Bezeichnung: "vorstehendes Gebiss" aber reservirt er nur für diejenigen Fälle, wo die obere Vorderreihe übermässig vor die untere beisst. Das übermässige Vor- und Rückstehen beider Kiefer zugleich, ob teratologisch, und also accidentell, oder ob physiologisch-ethnologisch, lässt er unberührt.

Die unmittelbar causal-essentiellen* Zustände finden wieder bei Mühlreiter eine umfassendere Berücksichtigung, als bei Carabelli; freilich ist von einem genügend erschöpfenden, specialisirten Systeme in dieser Beziehung, auch bei Mühlreiter keine Rede.

Dass man auch bei den Mühlreiter'schen Auseinandersetzungen nicht stehen bleiben konnte, beweist schon der Umstand, dass gerade Baume, obwohl er in seinem trefflichen Lehrbuche der Zahnheilkunde eben diesem Gegenstande nicht seine ganze auszeichnende Aufmerksamkeit gewidmet zu haben scheint, dennoch für das Mühlreiter'sche "rückstehende Gebiss" den Ausdruck "vorstehender Biss" substituirt; dass er also einerseits die Bezeichnung Gebiss für diesen Gegenstand nicht annehmen konnte, und andererseits ihm nicht passend schien, eine solche Art des "Bisses" rückstehend zu nennen, wobei ein auffälliges Vorspringen, nämlich das, der unteren vorderen Zahnreihe, als Hauptmerkmal in die Augen fällt, und auch thatsächlich in vielen, nämlich solchen Fällen nicht nur scheinbar, sondern wirklich vorhanden ist, wo die essentielle teratologische Ursache dieser Erscheinung nicht etwa in einer minderen Evolution des Oberkiefers, sondern in einer übermässigen Evolution des Unterkiefers besteht. Da nun Baume auf diese Weise das Vorspringen für diese Fälle aufbrauchte, blieb ihm nichts besseres übrig, als die andere, nur auf die eine Vorderreihe beschränkte Art des "Mordex prorsus" als "vorstehende obere Zahnreihe" zu bezeichnen, da er zur Vermeidung von Verwechselung und wegen des wirklichen Mangels eines richtig klappenden Bisses in diesen Fällen das Wort "Biss" auch nicht anwenden konnte.

Im Uebrigen kann von Baume's Darstellung dasselbe gelten, was bei der Anführung Mühlreiter's gesagt wurde.

Was nun die englischen und amerikanischen Autoren betrifft, so scheinen dieselben auf die Nomenclatur kein besonderes Gewicht gelegt zu haben, dabei leisteten sie aber um so

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* Ich verstehe hier unter Causal-Essentialitäten die abnormen, also schon patho- oder teratologischen Zustände, welche zwar die mehr oder weniger unmittelbaren, jedoch nicht primären, also eigentlich aetiologischen Ursachen diesartiger Deformitäten sind. Unter diesen Causal-Essentialitäten nun sind auch die weniger unmittelbaren als "mediate" von den ganz unmittelbaren oder immediaten zu unterscheiden.

Gediegeneres im Wesen der Sache. So z. B. findet sich unter anderem in dem "System of Dental Surgery" von J. und Ch. Tomes, S. 117 eine werthvolle und ganz correcte, causal-essentielle Unterscheidung, indem daselbst die Zahnirregularitäten im Allgemeinen, also auch diejenigen, welche Bissanomalien bedingen, einerseits in solche, bei welchen die Wurzeln der Zähne am richtigen Orte sich befinden, und welche also nur durch eine Zahnneigung entstehen, andererseits in solche, bei welchen die betreffenden Zähne im Ganzen, d. i. sammt ihrer Wurzel unrichtig stehen, unterschieden werden.

Hinwieder findet man die populär-englische, allgemein als "underhung bite" oder "jaw" bezeichnete Irregularität auf S. 450 und S. 452 (der 10. Aufl.) der "Principles and Practice of Dentistry" von den amerikanischen Autoren, Harris und Austen in zwei Gruppen getrennt. In die eine Gruppe werden nämlich diejenigen Fälle zusammengefasst, bei welchen kein Evolutionsmissverhältniss des oberen unteren Alveolarbogens zu einander nachzuweisen ist, sondern die Deformation angeblich nur durch eine Abnormität in der Glenoidalarticulation, nämlich durch einen subluxationsartigen, übermässigen Vortritt des ganzen, sonst normalgrossen Unterkiefers vor den oberen—wie das auch schon von Gynnel nach Wedl's "Pathologie der Zähne" S. 80 angenommen wurde—bedingt wird; und welche auch zur besseren Unterscheidung unter dem besonderen Namen "Protrusion of the lower jaw" zusammengefasst werden. In der anderen Gruppe aber werden die übrigen Fälle des "underhung jaw" vereinigt, bei welchen nämlich bald ein Missverhältniss in der Entwickelung beider Alveolarbögen, bald eine blosse Stellungs- und Richtungsanomalie der betreffenden Zähne die causal-essentiellen Momente sind, was auf S. 450 des ebenerwähnten Werkes folgendermassen ausgedrückt ist: "It (nämlich die gedachte Deformität) may result from a want of correspondence in the development of the teeth and alveoli of the two maxilla, the upper jaw being defective in size, while the lower jaw is natural; or the former being natural, the latter may be in excess. It may also arise from a simple eversion of the lower teeth or inversion of the upper."

Hier wird also unter Inversion eine blosse Einwärtsneigung verstanden. Salter gebraucht aber diese nämliche Bezeichnung in einem anderen Sinne, wie dies aus folgenden Worten, auf S. 51 seiner "Dental Pathology and Surgery" erhellt: "Inversion of the teeth is another and very rare form of irregularity. I have seen both superior lateral incisors completely inverted and growing upside down; the crowns of the teeth appeared in the nostrils, from which I removed them."

Es liegt also schon hierin ein Beweis der Unstetigkeit der Begriffsbestimmungen und Bezeichnungen in diesem Zweige der odontologischen Deformitätslehre, was besonders für jüngere Studirende eine überflüssige Erschwerung bedingt, und was bezüglich anderer, als der jetzt in Rede stehenden Kieferdeformitäten aus dem Umstande noch mehr erhellt, dass Kingsley, in seinem nur vor kurzer Zeit publicirten obengenannten, Werke, zu dem Geständnisse gedrängt erscheint, dass er mit Dr. Langdon Down darüber nicht einig werden konnte, welche Fälle von den, durch die beiden Herren gemeinschaftlich untersuchten unter die übermässig hohen und engen Gaumen zu zählen wären und welche nicht, wie dies aus folgendem Originalwortlaute von S. 36 des schon erwähnten Kingsley'schen Werkes zu ersehen ist: "In this way only is to be accounted for the difference of opinion, which existed between us upon many cases, which seemed to him an unduly high vault to the palate, narrowed arch, or irregularity, but which to my eye come clearly within the limit of normality."

Wären aber diesbezüglich fixe, international vereinbarte Indexe vorhanden gewesen, so hätte man einfach nur die Maasse zu bestimmen gehabt und damit wäre der Ausschluss oder die Beherrschung jeder Meinungsverschiedenheit für alle Zeiten gegeben.

Wenn wir nun unser Augenmerk noch auf Frankreich richten, so begegnen wir, als diesbezüglich wichtigstem Werke: dem "Traité des Anomalies du système dentaire" von

Magitot. Dieses Autors Auffassung betreffs des gegenwärtigen Themas stimmt nach dem V. Kapitel des genannten Werkes mit der Mühlreiter'schen darin überein, dass er dieselben Fälle unter seine relative "retroversion totale ou complète" subsummirt, welche Mühlreiter als rückstehende Gebisse bezeichnete, und ebenso verhält es sich mit der relativen "anteversion complète" und dem "vorstehenden Gebiss." Er geht aber insofern weiter als Mühlreiter, dass er, wie Carabelli und Wedlstet, auch die sogenannten "Prognathismen," und zwar ausführlicher als die beiden letztgenannten, bespricht. Er unterscheidet nämlich ausdrücklicher den "Prognatisme tératologique" und zwar eo ipso "accidentel" vom "Prognatisme ethnologique" und begrenzt auch diese beiden als "absolut" im Gegensatze zu seinen completen oder totalen "Ante- und Retroversionen" welche er als "relatives" bezeichnet.

Betreffs der weiteren, diesbezüglichen Darstellungen Magitot's, will ich in möglichster Kürze wenigstens noch folgende, analytische Bemerkungen machen.

1.—Mit seiner Definition der accidentellen "Anomalies de Direction absolues ou totales," welche auf S. 142 seines genannten Werkes folgendermassen lautet: "Nous entendons par ce titre les déviations dans la direction comprenant dans un mouvement de projection double et uniforme les deux arcades dentaires, qui restent ainsi dans leurs rapports ordinaires de rencontre" scheint—wenn nicht etwa Druckfehler im Spiele sind —folgender Passus auf S. 140 l. c., "Telles sont les déviations de direction dites 'absolues' du système dentaire; elles occupent soit la région antero supérieure, soit l'antero inférieure," &c., nicht in einer ganz absolut vollkommenen Harmonie zu sein.

2.—Indem Magitot bei seinen diesbezüglichen Bestimmungen, die durch irgend eine blosse Zahnneigungsart bedingten "Ante- und Retroversionen" von den durch übermässige oder zu geringe, blos Ober- oder blos Unterkieferevolutionen bedingten ebensolchen Versionen selbst sachlich nicht gehörig, und nominell gar nicht unterscheidet, erfolgt eine unvortheilhafte Vermischung und ungerechte Vertheilung von zwei verschiedenen Objectzuständen: nämlich einerseits von der in blosser Erscheinungsform bestehenden Bissart; andererseits von den causal-essentiellen Bedingungen dieser Erscheinungsform, und zwar hauptsächlich der Zahnneigungen blos für die "Retroversion." Dieses Verfahren scheint mir aber insofern ungerecht als z. B. eine von diesem Autor sogenannte Anteversion vorhanden sein kann, ohne dass die Vorderzähne allein oder sonst mit dem entsprechenden Alveolartheile, eine schiefere Richtung zeigten, als bei gewöhnlichen Fällen mit normalem Biss, indem auch eine übermässige Oberkieferentwicklung mit sonst richtig geneigten Zähnen eine sogenannte "Anteversion" verursachen kann, wie dies am nachträglich zu demonstrirenden Schädel zu ersehen sein wird. Und umgekehrt kommt es gewiss vor, dass ein blosser Zahnneigungsfehler ohne Evolutionsfehler eine sogenannte "Retroversion" selbst im Magitot'schen Sinne bedingt, wie das schon aus den bisherigen Ausführungen anderer, wenn auch weniger Autoren erhellt, und ebenfalls auch an einem mitgebrachten, nachträglich zu demonstrirenden Schädel zu ersehen sein wird.

3.—Bezüglich der Ausdrücke "absolu" und "relatif" ist wohl zu bemerken, dass Broca schon früher und besonders in seiner "Instruction cranialogique," S. 53 die Epitheta "simple" und "double" für die Prognathie der Zähne angewendet hat, und Topinard in seiner Abhandlung "Des diverses espèces de Prognatisme," S. 5 und in seiner "Anthropologie," S. 286 ohne Anwendung des Wortes "relatif" einen "prognatisme dentaire supérieur et inférieur" aufstellt, freilich mit dem Ausdruck des Zweifels über die Existenz des "prognatisme dentaire ethnologique" überhaupt. Ich glaube nun, dass die Anwendung des "dupplex" im Falle der gleichgearteten Irregularität beider Kiefer im Gegensatze zum "superior und inferior" eine allgemeiner verwendbare und sicherere Bezeichnungsweise abgeben würde, und so könnten auch die Ausdrücke

"absolutus" und "relativus" für andere, ihnen entsprechendere, weiterhin anzugebende Verhältnisse zweckmässig aufgespart werden.

Bei all der Wenigkeit dieser An- und Ausführungen glaube ich dennoch, dass ich mit Rücksicht auf die hier bemessene Zeit, die noch unerwähnten, jedoch ganz gediegenen ante und post Carabelli'schen Autoren wie Hunter, Fox, Bell, Linderer, Maury, Taft, Garretson, O. Coles, Coleman und andere nicht weiter zu besprechen brauche, indem durch das Gesagte der gegenwärtige, nicht eben besonders günstige Standpunkt dieses Themas genügend beleuchtet sein dürfte. Auch wird hoffentlich—nach den diesbezüglichen Leistungen der angeführten Autoren zu urtheilen—genügend ersichtlich sein, dass wohl in praktischer, besonders therapeutischer Hinsicht Erkleckliches geleistet worden ist, aber in der theoretisch anatomischen Systemisirung, Definition und Nomenclatur konnte bis jetzt von einem gleichen Fortschritte nicht die Rede sein.

Die Bissarten und ihre Beziehung zur "Prognathia ethnologica."

Was nun meine diesbezüglichen, eigenen, zu weiterer Anregung bestimmten Positivideen anbelangt, so halte ich es vor Allem für hochwichtig und nothwendig, dass—wie erwähnt—ja nicht verschiedene Objectspecialitäten und Zustände untereinander gemischt oder auch nur miteinander vereinigt betrachtet werden, sondern jede Erscheinungsform von allen Causal-Essentialitäten * gesondert, und selbst diese, sobald sie irgend welche wesentliche, mehr generische Verschiedenheiten zeigen, auch getrennt in Betracht gezogen und benannt werden. Ohne eine genaue solche Sonderung wird es nicht nur schwer, sondern, ich wage es auszusprechen, geradezu unmöglich, die wünschenswerthe Exactheit, Klarheit und Uebersicht in dieser Angelegenheit zu erreichen.

Nun sind aber—abgesehen von jener schon erwähnten Gynnel-Harris'schen Protrusionen—bei den Bissanomalien dreierlei Hauptmomente zu berücksichtigen. Das eine ist die unmittelbarste äussere Erscheinungsform des Bisses selbst. Die beiden anderen sind unmittelbar causal-essentiell in Bezug auf den Biss. Es sind dies einerseits die Stellungs- und Richtungsanomalien der Zähne selbst, und andererseits die Evolutionsverhältnisse der Alveolarfortsätze, besonders der Kiefer und der Unterkieferäste.

Zunächst ist also nothwendig, dass einstweilen ohne Rücksicht auf irgend ein bedingendes Essentielmoment die Arten der blossen Aneinanderlagerung der beiden Zahnreihen in ihren gegenseitigen Lagenverhältnissen in Betracht gezogen, specialisirt und benannt werden. Hierbei erscheint es mir erwünscht bei der eben dargestellten Unzugänglichkeit bisheriger Auffassungen und Systeme nöthigenfalls auch ganz unabhängig von dem Gewohnten und bisher Bestandenen vorzugehen. So erscheint es mir nicht unzweckmässig, dass sogenannte Vor- und Rückstehen oder Springen nicht mehr als bestimmendes Hauptmerkmal zu betrachten, da ja doch bei diesen beiden Arten relativ der eine Theil stets vor-, während der andere Theil stets zurücktritt, so dass man eigentlich in beiden Fällen sowohl von einem Vor- als Rückstehen oder Springen reden könnte. Viel zweckmässiger erscheint es mir, den Oberkiefer ein für allemal gleichsam als den fixen, und nur den Unterkiefer als den lageändernden Theil—wie es auch relativ wirklich der Fall ist—zu betrachten. Man braucht dann weiterhin nur für die Aneinanderpassung oder Schliessung der beiden Zahnreihen eine passende, womöglich altclassische Stammbezeichnung zu suchen, welche sich durch passende Zusätze zu specialisirenden Zusammensetzungen gut eignet. Für eine solche halte ich das griechische Wort ἁρμοσις, also:

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* Ich verstehe unter Causal-Essentialitäten die abnormen, also patho- oder teratologischen Zustände, welche zwar die mehr oder weniger unmittelbaren, jedoch nicht primären, also eigentlich ätiologischen Ursachen diesartiger Deformitäten sind. Unter diesen Causal-Essentialitäten nun sind auch die weniger unmittelbaren, als "mediate," von den ganz unmittelbaren oder immediaten zu unterscheiden.

ὀδονθάρμοσις. Es stammt von ἁρμοζειν, fügen, zusammenpassen. Hieraus stammt auch ἁρμός und ἁρμογη, Fuge, welche auch unter Umständen angewendet werden kann, aber in gewöhnlichem, mehr activem Sinn halte ich das Wort "Harmose" für das zweckmässigste. Da nun im Griechischen für "an-, ein- und entgegenpassen oder fügen" die Wörter εφ-, εν- und προς-αρμοζειν, sowie auch die Participialadjective εφ-, εν- und προς-αρμοστος existiren, so kann ebensogut auch εν-, εφ- oder προσαρμοσις gesagt werden.

Wenden wir nun diese Wörter auf die drei Hauptarten der Zahnreihenschliessung mit Rücksicht auf die relative Fixität des Oberkiefers an, so haben wir mit der "Enarmose" die Einpassung des Unterkiefers, nämlich den sogenannten normalen Biss, mit der "Prosarmose," die Entgegenpassung, nämlich den geraden Biss, und mit der "Epharmose" den sogenannten unten vorstehenden oder rückstehenden, oder sonstwie genannten Biss nach meinem Dafürhalten genug zweckmässig bezeichnet. Hierbei müssten natürlich nur diejenigen Fälle berücksichtigt sein, bei welchen die Aneinanderlagerung ziemlich genau passend wäre. Im entgegengesetzten Falle, wo nämlich bei der Schliessung mindestens ein Raum von drei Millimetern zwischen den vorderen Zahnreihen verbliebe, hätte man entweder eine "Phaulenarmose" (von φαύλος, fehlerhaft), welche dem bekannten, häufigen oben vorstehenden Gebiss, oder eine "Phaulepharmose," welche dem nach den Sitzungsberichten der Kais. Wiener Akademie vom 1. Juli 1869 durch Professor Langer demonstrirten Fall entsprechen würde, wie solche übrigens auch in den anthropologischen Sammlungen in Berlin und Paris vereinzelt zu finden sind. Eine fehlerhafte Prosarmose fände meist nur in der "Anarmose," nämlich im sogenannten "offenen Gebiss" einfacher, gewöhnlicher Art Ausdruck. Wenn ferner eine Vermischung der Schliessungsarten vorhanden ist, lässt sich auch diese bald als "Haplomixarmose" (von ἁπλους, einfach), wo nur die ganze rechte und linke Hälfte der Vorderreihen miteinander abwechseln, und bald als "Tyrbomixarmose" (von τυρβα, durcheinander), wo mehrere Zähne bei einem gewissen Individuum in verschiedenen, miteinander abwechselnden Harmosearten zu finden sind, bezeichnen. Wenn aber nur ein Zahn aus Reih' und Glied wäre, so könnte das eine "Monarmose" und zwar entweder eine Moneph-, oder eine Monenarmose heissen.

Alle diese Bezeichnungen könnten sich ohne dem Epitheton "posterior," natürlich nur auf die Vorkommnisse in den Vorderreihen, welche nämlich die wichtigsten und häufigsten sind—aber auch auf diese nur für die labiolingnale Richtung—beziehen. In derselben Weise lassen sich aber mit "μέτα," also als "Metharmosen" auch die selteneren Fälle der mesio-dittalen Abweichungen, und zwar auch als "anteriores" und "posteriores" bezeichnen. Eine solche hintere "Metharmose" vereint mit vorderer "Epharmose" wäre die vorhin nach Gynnel-Wedl und Harris-Austen angeführte Art von "underhung jaw," welche durch die beiden letzteren Autoren "Protrusion of the Lower Jaw" bezeichnet wurde.

Das eben Gesagte enthält beiläufig meine Neuerungsideen bezüglich der äusseren Erscheinungsform des Zahnreihenschlusses oder Bisses.

Nun sind die beiden wichtigsten causal-essentiellen Momente in Betracht zu ziehen, wozu ich hier von Vornherein bemerken muss, dass während die Anthropologie hauptsächlich mit normalen Fällen zu thun und also schon die mindest abnormen Fälle auszuscheiden hat oder hätte, nachdem sie die abnormen Fälle mehr nur in zweiter Reihe nebenbei zu berücksichtigen braucht, muss die praktische Odontiatrie und Odontologie sich hauptsächlich mit abnormen, und nur zur klärenden Beihilfe auch mit normalen Fällen, befassen, wobei die fast unendliche Mannigfaltigkeit der patho- und teratologischen Verhältnisse eine grössere Schwierigkeit bedingt. Deshalb müssen auch von den ethno-anthropologischen abweichende, auch für abnorme Fälle sicherer verwendbare Bestim-

mungsmethoden und selbst eine verschiedene Nomenclatur in Anwendung gebracht werden, wobei eine besondere Aufmerksamkeit für die Gaumenlänge und ihre Beziehung zur Hirnschädelcapacität als am meisten zweckdienlich erweist, was in der Anthropo- resp. Ethnologie zur Bestimmung der Grade der sogenannten "Prognathie" viel weniger der Fall sein dürfte.

In erster Reihe nun treten bei dieser Betrachtung der Causal-Essentialitäten die sogenannten Versionen oder Neigungen der Zähne, respective ihrer Kronen und Wurzeln oder auch ihrer Alveolen entgegen.

Diesbezüglich kann gleich jetzt bemerkt werden, dass zur Beurtheilung des Neigungsgrades von irgend einem Zahne getrost die Direktion der Kronenaxe als massgebend angenommen werden kann, da die Krümmungen beim Zahnhalse oder noch tiefer, nämlich an der Wurzel, nur Ausnahmsfälle representiren, und wenn dies auch nicht der Fall wäre, für die Art des Bisses doch immer nur die Kronenrichtung, soferne diese als bedingendes Moment fungirt, entscheidend ist. Aus diesen zwei Gründen ist es nicht nothwendig, ferner von den Wurzeln und Alveolen zu sprechen, indem für die überwiegende Mehrzahl ihre Richtung als gerade Fortsetzung der Kronenaxe, oder sonst als diesbezüglich bedeutungslos, angenommen werden kann.

Die Zahnversionen sind nun am häufigsten labiolingual, d. h., nach Aussen oder nach Innen. Hier wären also unabhängig von der Art der Zahnreihenschliessung die Bezeichnungen Ante- und Retroversion auch so ziemlich verwendbar. Ich halte aber die, im Englischen üblichen Ausdrücke, "eversion" und "inversion" für vortheilhafter, weil sie kürzer, plastischer und auch sachlich zweckentsprechender sind, indem sie mit der so ziemlich allgemein verbreiteten distalmesialen und labiolingualen Auffassung übereinstimmen, und demgemäss selbst für die selteneren Zahnneigungen in distalmesialem Sinne, als "deversio" und "adversio," ja sogar für die gänzliche Umkehrung eines Zahnes um die horizontale Axe als "reversio" (statt Salters "inversion") verwendet werden können, so dass hievon nur die "torsio" verschiedener Grade für die Drehung um die verticale Axe—wie reell, so auch nominell—ganz abweichen würde. Die genaueren Specialisirungen würden mittelst der Epitheta "relativus et absolutus," "abruptus et continuus," "simplex et dupplex," "anterior et posterior" und "superior et inferior" effectuirt werden.

Bezüglich der zwei letzteren Paare ist, glaube ich, jedes weitere Wort überflüssig. Ueber das "dupplex," im Gegensatze zum "simplex" sprach ich meine Ansicht zum Theil schon vorhin bei Gelegenheit der Ausführung von Magitot's diesbezüglicher Darstellung aus. Ferneres hierüber ist aus dem zu entnehmen, was weiter über das "absolut" und "relativ" gesagt werden wird. Die Ausdrücke "abruptus et continuus" innerhalb der Grenzen des anterior und posterior würde ich dem "partialis" und "totalis," oder "completus" darum vorziehen, weil diese letzteren zu sehr an die Totalität des Gebisses oder wenigstens an eine ganze obere, oder untere, oder aber zugleich auf die obere und untere, wenn auch nur vordere Reihe erinnern. Es bleibt also nur das relativ und absolut näher zu besprechen übrig. Ich würde mit "relativer" Zahnneigung eine solche scheinbare oder wirkliche Version bezeichnen, welche schon bloss durch den Anblick bestimmt, aber nur im Vergleich zu richtig stehenden, überwiegenden benachbarten Zahnreihenpartnien sicher als eine Direktionsabweichung erscheint. Eine absolute Version muss dann jede Abweichung von der bei einem gewissen Volke als vorherschend und also relativ richtig erkannten Direktion der Zahnkronenaxen heissen. Die erstere Art hat eine sofort einleuchtende, praktische Bedeutung, und lässt sich leicht schon beim ersten Anblick bestimmen, selbst wenn sie eine ganze Zahnreihenparthie betreffen würde. Nicht so die letztere Art, welche auf den ersten Anblick keine praktische Bedeutung zu haben scheint, und deren Bestimmung gar nicht einfach ist. Indessen

kann selbst in praktischer Hinsicht unter Umständen wünschenswerth erscheinen, eine zweifellose Constatirung ihres Vorhandenseins zu erlangen, so z. B., wenn eine "Eversio dupplex" der Vorderreihen nicht durch den Anblick mit Bestimmtheit erkannt werden kann, wie das an einem der mitgebrachten anatomischen Präparate zu ersehen sein wird. Ich halte es daher für gut, hierüber noch folgendes mitzutheilen.

Zur Bestimmung des Neigungsgrades von ganzen Vorderreihen—denn es kann sich ja, wie eben erwähnt, hier nur um diese handeln—ist bei der hienach vorausgesetzten Continuität der Version genügend, die beiden Centralincisoren, oder bei vorhandener Symmetrie auch nur einen derselben, zu berücksichtigen. Man kann nun zur Messung des Neigungswinkels entweder die Anthropologie, resp. ihre Bestimmungsmethode der sogenannten Prognathia ethnologica überhaupt zum Muster nehmen, indem man die Horizontalrichtung der natürlichen Stellung des Kopfes sucht und die bei einzelnen Völkern allgemeinsten Neigungsgrade zu dieser Horizontalen bestimmt; oder unabhängig hievon die leicht zu einer geraden schematisirbaren Alveolarrandlinie als fixe massgebende Grundlinie betrachten und die Zahnneigungen zu dieser Linie messen. Ich, meinestheils, halte vom praktischen Standpunkte aus die letztere Methode für die bessere, denn die massgebende Grundlinie derselben ist so ziemlich fix und lässt auch eine bequeme Vergleichung mit anderen Säugethieren zu, da bei den meisten derselben, den Menschen nicht ausgenommen, anerkannter Maassen die Alveolarrandlinie, resp. die Gaumenaxe in den meisten Fällen eine solche (relativ) fixe Richtung darstellt, worauf die Axen der meisten Zähne—wenigstens gewiss fast immer die, der Hauptreihe, nämlich der Kauzähne im Normalzustande—senkrecht zu stehen pflegen, während man zur Bestimmung der Prognathien, nach jetzt üblichen anthropologischen Methoden, wie es allgemein anerkannt ist, zuerst die Köpfe, resp. die Schädel—conditio sine qua non—in die vermeintlich richtigste Naturlage bringen muss. Nun besteht aber bezüglich dieser "richtigsten Naturlage" eine solche Meinungsverschiedenheit unter den ersten Autoritäten der Anthropologie, dass solche sogenannte richtige Grundebenen nach S. 271 von Topinard's Anthropologie nicht weniger als 15 angegeben wurden, sowie auch als Endpunkte der Schenkellinien des Prognathiewinkels fast ebenso viele angenommen werden, als bedeutendere Autoritäten hierüber geforscht und geschrieben haben.

Um also solche Unstetigkeit, und auch sonst um Verwechselungen mit der anthropoethnologischen Prognathie zu vermeiden, wählte ich die andere Methode, und construirte zur bequemen und sicheren Ausführung der Messung ein Messinstrument, welches ich ad vocem Stomakace mit dem aus wohlbekannten griechischen Wörtern zusammengesetzten Namen "Stomameter" benenne, und dessen Anwendung ich nach Beendigung dieses Vortrages sammt dem Instrumente zu demonstriren beabsichtige.

Das Princip der Entscheidung darüber, ob nach der Messung eine absolute Versionsanomalie anzuerkennen sei oder nicht, beruht darauf, dass man die, für ein gewisses Volk, oder eine Hauptmenschenrace als Mittelschwankung gefundenen Grenzwerthe zur Richtschnur nimmt, und das darunter befindliche als "inversio," das darüber befindliche als "eversio" nämlich "dentalis" und zwar "absoluta" bezeichnet.

Die Bestimmung der mittleren Schwankungsgrenzen ist eigentlich Sache eines mehrseitigen Uebereinkommens und Prüfens. Indessen will ich zur vorläufigen Richtschnur anführen, dass ich nach meinen bisherigen Resultaten—denn Untersuchungsserien müssen hier wegen Kürze der Zeit wegbleiben—die Schwankung bei Europäern zwischen 90°, d. i., dem rechten Winkel und 10° als Mittelstandarte gefunden habe, so dass, wenn man Zahlenangaben gebrauchen wollte,—der rechte Winkel gleichsam als 0 betrachtet—die übrigen Werthe beziehungsweise mit + oder — bezeichnet werden könnten, und natürlich inclusive bis zum + 10. Grade selbst bei Europäern von keiner Versionsabnormität die Rede sein dürfte.

Hiezu muss ich auch schon hier vor der Demonstration bemerken, dass als Messobject der mesiale Rand der Labialoberfläche der centralen Incisoren oder auch nur von einem derselben zur Bestimmung genügt, und zwar aus Gründen, welche aus dem früher Gesagten zu entnehmen sind.

Noch ist zu erwähnen, dass bei vorausgesetzter angebogener, also gehöriger Form des Zahnganzen (wie es auch in dem eingangserwähnten Tomes'schen Werke ausgesprochen wird) es nöthig ist auch auf die bei gerader Form aus der Kronenrichtung zu folgenden Wurzelstellung zu achten. Denn wenn bei einer solitären oder abrupten Abweichung zugleich die Wurzel unrichtig steht, ist nicht, oder nicht blos eine Versionsanomalie, sondern—sagen wir bei minderer Entfernung ad vocem Diastem—ein "Endo-" oder "Ekto-stem" für die labiolinguale Richtung, und ein "Metastem" für die mesiodistale Richtung vorhanden. Für entferntere Stellungsanomalien passt das im Gebrauch befindliche Wort Heterotopie. Für die Richtigkeit sowohl der Stellung als der Richtung könnte man etwa das Wort Orthostem anwenden.

Die Wurzelstellungsanomalie ganzer Reihen ist natürlich mit der, im Nachfolgenden zu besprechenden, Anomalie identisch. Bevor ich aber auf diese übergehe, will ich noch erwähnen, dass auch die Neigung des vorderen oberen Alveolartheiles (also der, dem Os intermaxillare entsprechenden Parthie) zur Alveolarrandlinie, d. i., gleichsam eine Art von ethnologischer Prognathie auch nach demselben vorangeführten Principe und mit dem von mir construirten Stomameter gemessen werden kann, ohne dass man erst die so viel gesuchte, vermeintlich natürlichste und beste Horizontalstellung des Kopfes, resp. Schädels, brauchte.

In zweiter Reihe sind nun diejenigen essentialen Bedingungsmomente zu besprechen, welche ebenfalls verschiedene abnorme Zustände des Bisses hervorbringen können und deren Wesen aber nur in irregulären Evolutions-, oder einfacher gesagt, Grössenverhältnissen der Kiefer, resp. ihrer betreffenden Theile, so, z. B., in einem basalen Uebermass oder Mindermass des Alveolarbogens, besonders vorne, besteht. Diese letztere ist zwar durchaus nicht mit dem Wachsthum der Kieferkörper unlöslich verbunden, jedoch in dieser Hinsicht insofern damit gleichwerthig, als eine blosse Grössenveränderung des Alveolarfortsatzes allein, ohne dass dabei die Kieferdimensionen selbst verändert erschienen, diesbezüglich entweder keine Bedeutung hätte oder nur als eine blosse Zahnneigungsanomalie, welche zu der vorherbesprochenen gehört, zum Ausdruck käme. Um nun diese Zusammenfassung kurz auszudrücken, gebrauche ich die Bezeichnung, "basale Grössenveränderung des Alveolarbogens," womit ich natürlich auf die Basis des Alveolarfortsatzes, zugleich aber—für die meisten Fälle—auch auf den betreffenden Kieferkörper hinweisen will.

Was nun die basalen Grössen- oder Evolutionsverhältnisse am Ober- oder Unterkiefer anbelangt, so kann natürlich—abgesehen von der normal richtigen—entweder nur eine zu geringe oder übermässige Evolution derselben, und zwar entweder des einen von beiden, oder beider zugleich vorhanden sein. Ich halte es für zweckmässig, diese Zustände auch mit besonderen Namen zu bezeichnen, und zwar aus den bisher und weiterhin angegebenen Gründen mit solchen, welche mit denen der ethnologischen Prognathie nicht identisch sind. Ich schlage z. B. für einen zu wenig entwickelten Kiefer den Namen "Endeognathia," von ἔνδεης, dürftig; für den übermässig entwickelten, "Perissognathia," von περίσσος, übermässig, und für den normal richtig entwickelten, "Kairognathia," von καιρός, das rechte Maass, vor. Dem "superior" oder "inferior" als simplex würde auch hier das "dupplex" entgegenstehen.

Diese Nomenclatur an sich würde hoffentlich keine Schwierigkeit, sondern eher eine erleichternde Klarheit bedingen. Einige Schwierigkeit liegt auch hier nur in der Bestimmung der Grenzen des Mittelmaasses.

Diesbezüglich muss nun besonders bemerkt werden, dass hier die Prognathia ethnologica als maassgebende Aushilfe noch weniger verwendbar ist, als bei den Zahnneigungsanomalien; und zwar aus folgenden Gründen, welche ausser den schon gesagten zugleich die Meidung der anthropologischen identischen Benennungen rechtfertigen.

1.—Selbst der Winkel des Topinard'schen "Prognatisme alveolo-sousnasal," welcher noch am Sichersten zu sein scheint, bestimmt ja doch hauptsächlich bloss die Neigung jenes Oberkiefertheiles, welcher beiläufig dem in früher Entwickelung unverwachsenen Os intermaxillare entspricht. Und wenn man auch annehmen würde, dass selbst eine wirkliche Vergrösserung des Os intermaxillare und nicht zugleich und besonders immer auch seine Neigung—was übrigens nicht der Fall sein kann—im Maassstabe der Prognathie Ausdruck fände, so würde doch in dieser Messung ein zu kleiner Theil des Oberkiefers als Anzeiger des ganzen figuriren; während ich der Meinung bin, dass bei den frühesten Messungen der Prognathie selbst die ursprüngliche Grundidee für die weiteren Folgerungen darin bestand, dass je länger, oder eigentlich grösser der Kiefer, resp. der diesen representirende Gaumen im Vergleich zum Hirnschädel ist, desto kleiner der Prognathiewinkel und desto tiefer die Stellung des betreffenden Thierindividuums in der hyerarchischen Reihenfolge; und wenn man sich nun bloss auf die Betrachtung des Os intermaxillare, beschränkt, so kann man durch den Einfluss seiner blossen Stellungs- oder Neigungsverschiedenheiten, dann aber bei den nicht Topinard'schen Prognathien auch in Folge der blossen Gestaltverschiedenheiten des Hirnschädels, namentlich ihrer Höhenverhältnisse bei gleicher Capacität, zu Irrthümern geleitet werden. So zum Beispiel würden manche Neger mit abwärtsgeneigtem Os intermaxillare höherstehend erscheinen, als manche Carnivoren mit geradevorstehendem Os intermaxillare, wie z. B. die Canida, Viverrida, und selbst die meisten Ursida. Nun ist es zwar auch möglich, was die Anthropologen wissen mögen, dass bei Menschenracen die hyerarchische Abstufung nicht nach der verhältnissmässigen Kiefergrösse, resp. nach der diese representirenden Gaumenlänge sich richtet, sondern eben nach der blossen Neigung des dem Os intermaxillare entsprechenden Oberkiefertheiles zu beurtheilen ist. Dies kann wohl für die Anthropologie gelten, aber die praktische Odontiatrie und Odontologie haben eine directe Bestimmung und Vergleichung der Gaumenlängen selbst nöthig.

2.—Gesetzt aber, dass die Grösse des Intermaxillartheiles auch als Anzeiger für den Entwickelungsgrad der ganzen Gaumenlänge, ja selbst des ganzen Oberkiefers dienen könnte, so glaube ich doch, dass eine directe Bestimmung der Gaumenlänge, im Falle ihrer Möglichkeit, für den gedachten Zweck doch immer vorzuziehen ist, welche (vom Os intermaxillare zum Zwecke des Ausschlusses von dem Einfluss ihrer Neigung sogar möglichst isolirte) Bestimmung auch eine Folgerung auf die Grösse des also ausgelassenen Intermaxillartheiles viel eher zulässt, als umgekehrt.

Auf diese Erwägungen hin habe ich folgende Ideen wenigstens für die odontiatrisch-odontologischen Bestimmungen für zweckdienlich erachtet.

Die verhältnissmässige Kiefer-, resp. Gaumengrösse irgend eines Individuums, lässt sich, auch ohne den Vergleich der Gaumenlänge zur ganzen Körpergrösse, oder etwa zur ganzen Kopfgrösse, durch den Vergleich dieser Länge—nicht etwa zur Länge einer einzigen Axe seines Hirnschädels, wie für manche einseitig bestimmte Prognathiearten geschehen ist, sondern—zur Schädelcapacität bestimmen, und die Angabe von hierdurch gewonnenen Beziehungsindexen erscheint mir nicht nur wohlberechtigt, weil der Gaumen ein Schädeltheil ist, und nicht nur mit Rücksicht auf früheren Brauch, sondern um so berechtigter, weil Oakley Coles ("Deformities of the Mouth," p. 95) und Dr. Claye Shaw (*Journal of Mental Science*, 1876, p. 200) sowie Meyer und andere diese Verhältnisse beobachtende Autoren ein evolutiv-corulatives Verhältniss zwischen Hirnschädel und Gaumen nachgewiesen haben.

Dass hierbei ein Kubikinhalt mit einem Linearmaass verglichen wird, macht aus dem Grunde gar keine Schwierigkeit, weil nach den Lehren der Stereometrie das Verhältniss von Kugelinhalten schon mittelst ihrer Durch- oder Halbmesser vollständigen Ausdruck gewinnen und jeder beliebige Kubikinhalt als Kugelinhalt gedacht werden kann, dessen Radius mittelst einfachen elementar-stereometrischen Calculs nach der Formel ξ (d. i. κ, nämlich κυβος und σ, nämlich σφηρης, also) $\xi = \frac{4}{3} r^3 \pi$, und hieraus $r = \sqrt[3]{\frac{3\xi}{4\pi}}$ leicht zu bestimmen ist. Die Zahl (oder der Exponent) nun, welche diesen Radius auf 100 gesetzt, das Verhältniss der Gaumenlänge zum betreffenden Radius ausdrückt, kann als "Index craniognathicus" bezeichnet werden.

Von der ganzen Gaumenlänge aber ist nun, wegen des möglichen, schon erwähnten Neigungseinflusses vom Intermaxillargebiete, nur die Strecke vom vorderen Rand des Eckzahnes bis zum hinteren Gaumenende in Rechnung zu nehmen; während—wie gesagt—das Gebiet des Os intermaxillare mit dem Haupttheil des Gaumens in stetig annähernd gleichem Verhältnisse zu sein vorausgesetzt werden kann. Beim Fehlen sowohl der oberen Eckzähne, als auch der lateralen Incisoren kann man die Grenze zwischen Os intermaxillare und eigentlicher Maxilla durch Abrechnung der abschätzbaren Incisorenstrecke bestimmen, oder solche Fälle bei nothwendiger, grösserer Genauigkeit eliminiren. Uebrigens können, da nicht directe, sondern bloss Verhältnisszahlen gebraucht werden, nach dieser Methode überhaupt keine bedeutendere Fehler vorkommen.

Auf diese Weise muss nun die Mittelstandarte für ein gewisses Volk, oder wenigstens für die drei Hauptracen, von denen nämlich die, der Internationalität wegen so zu nennende "albide" myoprognath, d. h. weniger prognath, die so zu nennende "flavide" aber schon mesoprognath, und die "negroide" plio oder plistoprognath, d. h., meist prognath ist, gesucht werden, und die Kiefermaasse, welche diese Mittelstandarte bei einer gewissen Race nicht erreichen oder übertreffen, sind je nachdem, bald "endeo-" und bald "perisso-gnathisch."

Bis zur Bestimmung durch mehrseitiges Uebereinstimmen kann ich hier für den vorläufigen Gebrauch angeben, dass meine bisherigen Untersuchungen bei der albiden Race auf eine Mittelschwankung des Index craniognathicus zwischen 72 und 74 also im Mittel auf 73 führten. Nur zum Vergleich ohne für europäische Praktiker irgend ein Interesse dafür zu supponiren, gebe ich an, dass ich bis jetzt diese Mittelschwankung beider Flaviden beiläufig gleich der der albiden Race,* bei der Negroiden aber zwischen 76 und 78, also im Mittel 77 gefunden habe.

Diese Methode lässt sich nun nicht nur zu Bestimmungen der Kieferverhältnisse an präparirten Schädeln, sondern auch mit ziemlicher, man kann sagen, mit eben solcher Genauigkeit zu diesartigen Bestimmungen am Lebenden verwenden, so weit man überhaupt am Lebenden Skeletmaassbestimmungen zu bewerkstelligen vermag. Ich habe nämlich mit einer Modification der Brocaischen Capacitätbestimmungsmethode für Schädelabgüsse und defecte Schädel (s. "Instructions craniologiques," S. 113), indem ich die drei Hauptaxen des Hirnschädels, resp. des Kopfes am Lebenden mittelst eines einfachen von mir construirten, später zu demonstrirenden Messinstrumentes gemessen, und so die erforderlichen drei Hauptdimensionen des betreffenden Parallepipedons und dreiaxigen Ellipsoids erhalten habe, Capacitätbestimmungen auch an Lebenden ausgeführt, und so den Index craniognathicus in einzelnen betreffenden Fällen der Praxis verwerthet.

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* Ein genug interessanter Befund, welcher mit der Correlation zwischen Gaumen und Schädelgestalt nach Claye Shaw l. c. zusammenzuhängen scheint.

Die Angabe einer genaueren Ausführung könnte vielleicht zu weitläufig werden, ich unterlasse sie daher bei dieser Gelegenheit.

Nur nebenbei soll hier noch gesagt sein, dass diese Art der Bestimmung von Endeo-Perisso- und Kairognathie vielleicht ebenso gut auch zur Bestimmung der hyerarchischen Reihenfolge der Anthropologie sich eignet, als die bisherigen Prognathiewinkelbestimmungen; man müsste nur natürlich diese Methode dann zur Bestimmung der ganzen Reihe normaler Säugethierschädel anwenden. Eine kurze Serie von Säugethierschädeln lautet z. B. folgendermassen:—

	Leo.	Ursus.	Sus.	Ovis.	
Capacitas cranii: ...	321 ...	265 ...	207 ...	150	(Topinard, "Anthropologie," p. 46).
Index craniognathicus ...	264 ...	282 ...	450 ...	300	(meine Funde).

Merkwürdig ist hier, dass das Schaf nach dem Index craniognathicus höherstehend erscheint, als das Schwein, was—gegen die Anzeige der Schädelcapacität—nach meinem Dafürhalten richtiger sein dürfte, und so sind nach der Schädelcapacität allein manche andere eclatante Widersprüche zu finden.

Was nun die Bestimmung des Unterkiefers anbelangt, so richtet sich diese nach dem Befund des Oberkiefers. Wenn es jedoch manchmal nothwendig erscheinen sollte, auch den Unterkiefer direct zu bestimmen, wie zum Beispiel im Falle, dass man bei übermässig kleinem Gaumen auch wissen wollte, ob der Unterkiefer nicht nur relativ zu gross, sondern ob er nicht zugleich absolut übermässig entwickelt ist, so müsste man auch für den Unterkiefer auf ähnliche Weise einen "Index craniognathicus secundus" aufstellen. Die Messung des Unterkiefers ist an sich am Lebenden unschwer, indem man vom Gonion zum Punctum mentale und die Linea, seu Axis bigonialis leicht messen kann, welche Linien aber die Seiten eines gleichschenkeligen Dreiecks bilden, dessen Höhe als untere Länge entweder direct durch Zeichnung oder mathematisch bestimmt werden kann.

Diese Bestimmungen betreffen nun mehr die basale Länge des Unterkiefers; da aber auch die Länge des Unterkieferastes und die Grösse des Winkels, welchen dieser mit dem Unterkieferkörper bildet, einen Einfluss auf die Bissform haben können, so will ich auch über diese soviel sagen, dass sie leicht durch anschliessende Diagnostik und directe Untersuchung brevi manu bestimmt werden können. Am präparirten Schädel sind sie nach den bekannten Weisungen der Anthropologie zu bestimmen. Wollte man nun auch für diese Fälle besondere Namen anwenden, so könnte man für die Grössen-, resp. Längenverhältnisse des Astes selbst die Wörter Endeo-, Perisso- und Kairoklonia, von κλίον, Ast; und für die Winkelverhältnisse die Wörter Nio-, Kairo- und Pliogonia, von bekannten griechischen Wörtern anwenden.

Die Fälle von Zahnverlust oder von übermässiger Höhe der Zähne, welche unter Umständen ebenfalls Causal-Essentialitäten, und zugleich primär ätiologische Momente der betreffenden Bissanomalien sein können, sind theils durch ausschliessende Diagnostik und theils durch die Daten des Status præsens sehr leicht bestimmbar, und bei ihrer sonstigen minderen Bedeutung hier nicht weiter zu besprechen.

In letzter Reihe wären noch diejenigen Fälle zu besprechen, bei welchen nach Gynnel-Harris nicht eine Evolutionsanomalie, sondern eine blosse, meist für ererbt gehaltene Vorschiebung gleichsam eine Subluxation des Unterkiefers vorhanden ist. Die Erkennung solcher Fälle wird durch den Umstand ermöglicht, dass ohne eine Vergrösserung des Unterkiefers oder eine Verminderung des Gaumens eine Epharmose zu finden ist, wobei die Spitzen und Einschnitte der gegenüberstehenden Kauzahnreihen nicht gut zusammenpassen. Diese Fälle geben keine weiter eintheilbare Specialitäten ab, und für

sie würde, wie schon oben erwähnt, nach der hier vorgeschlagenen Nomenclatur der Name der vorderen Epharmose bedingt durch eine hintere Metharmose passend sein.

Hiermit hätte ich nun die Darstellung meiner diesbezüglichen Positivideen beendet. Indessen halte ich es, trotz der für jetzt kurz bemessenen Zeit, für opportun, hier noch einige Worte über die Form des Gaumengewölbes zu bemerken, da z. B. eine ungewohnte Höhe desselben bald als Folge und bald—wenigstens nicht ganz selten—als Ursache mit den angeführten Anomalien, besonders den Zahnversionen, in essentiell-causalem Nexus stehen kann; und da die maasslichen Bestimmungen der Höhe des Gaumengewölbes überhaupt eben auch mittelst des, von mir jüngst construirten, erwähnten Stomameters bis jetzt am sichersten bewerkstelligt werden können, während solche Maassbestimmungen früher—wie das schon aus Kingley's obencitirtem Bekenntniss seiner Disharmonie mit Langdon Down zu ersehen ist—bis auf die Bestimmungen von Dr. Claye Shaw ganz fehlten, die Messmethode des letztgenannten Psychiatren aber als wenig praktisch auch wenig Eingang gefunden hat. Dr. Claye Shaw's Maasse sind nämlich, wie dies in dem *Journal of Mental Science*, July, 1875, p. 200 zu ersehen ist, nicht in Indexform gebracht, indem kein vergleichendes Verhältniss zu irgend einer anderen Dimension des Gaumengewölbes gesucht wurde, was jedoch unumgänglich nothwendig ist, da sogar ein ziemlich hoher Alveolarfortsatz noch immer keinen eigentlich hocherscheinenden Gaumen bedingen muss, sobald besonders eine entsprechende Gaumenbreite vorhanden ist, und ebenso umgekehrt. Auch sind in Claye Shaw's Bestimmungen keine Mittelschwankungsgrenzen angegeben.

Wie die Messung der Gaumenhöhe mittelst des Stomameters am Lebenden oder am Skelet actuell auszuführen ist, lässt sich ganz gut nur bei der praktischen Anwendung des Instruments selbst darstellen, wie ich nachträglich zu versuchen beabsichtige. Es sei jetzt vorläufig nur bezüglich des Principes der Messungsweise erwähnt, dass es darauf beruht, eine durch die als ziemlich gerade laufend vorherrschenden Parthieen der Alveolarrandlinie gelegte Ebene darzustellen, wie das mittelst dieses Instrumentes geschehen kann; und dann von dieser Ebene aus verschiedene, zu gewissen Punkten der Gaumenmittellinie senkrecht emporgerichtet gedachte Höhenlinien zu messen.

Wenn man nun die gefundenen Höhen mit den entsprechenden Breitestellen mittelst sogenannter Indexe in Beziehung bringt, so wird man ein ziemlich brauchbares und bestimmtes, für die Praxis genug wichtiges Bild von Form und Grad der Gaumenwölbung erhalten. Ein solcher Index kann vielleicht genug treffend als "Index gnathorophicus," von ὄροφος, Dach, und zwar der des hinteren Gaumentheiles oder Endes als "Index gnathorophicus posterior," der des vorderen Gaumenendes als "Index gnathorophicus anterior" und der des wichtigsten mittleren Gaumentheiles in der Gegend zwischen dem letzten Bicuspis und dem ersten Molarzahn als "Index gnathorophicus medius" bezeichnet werden. Zur Bestimmung dieser Indexe wählte ich für die Vergleichung mit der Höhe darum die Gaumenbreite und nicht die Länge, weil hauptsächlich die Gaumenbreite unsere Vorstellungen von der Gaumenconformation und besonders der Wölbungshöhe beeinflusst. Ja ich möchte sogar behaupten, dass der ebenverzeichnete "Index gnathorophicus medius" auch schon allein eine genügende Idee davon zu schaffen vermag.

Um nun auch für die Höhengrade des Gaumengewölbes numerische und namentliche Maassausdrücke zu erhalten, habe ich eine Mittelstandarte gesucht, und bis mehrseitiges Uebereinkommen diesbezüglich eine definitive Richtschnur fixiren wird, fühle ich mich nach meinen bisherigen Messungen bewogen, den "Index gnathorophicus medius" eines normalen Gaumens auf 30, oder eigentlich zwischen 25 und 35 schwankend zu setzen; eine Gaumenhöhe zwischen diesen Schwankungsgrenzen wäre also "soroph;" unter diesem Mittelmaass bis abwärts 15 wäreder Gaumen "su btopi-

noroph," und unter 15 wäre er "tapinoroph;" über 35 bis 45 wäre er "subhysoroph" und über 45 "hypsoroph" zu nennen, durch welche Bestimmungen jede künftige Meinungsdisharmonie für immer verbannt würde. Statt dieser Benennungen die Brocaischen Allgemeinausdrücke der "Meso-, Mega-" und "Mikrosomie" zu gebrauchen halte ich nicht für zweckmässig, weil mit diesen nicht so bequem die fünf nothwendigen Abstufungen bezeichnet werden können, und weil zu viel Aehnliches leicht eine irrthümliche Verwechselung verursacht.

Endlich will ich noch aufmerksam machen, dass Professor Ludwig Meyer in Göttingen die, auf eine gewisse, von ihm beschriebene Weise deformirten Schädeltypen von gleichfalls zusammengehörig eigenartigen Idioten, "Crania progenæa" genannt hat.

Bevor ich aber weiteres hierüber sage, muss ich zuvörderst bemerken, dass hier offenbar ein ethymologischer Fehler unterlaufen ist. Diese "Crania" sollten nämlich nicht "progenæa," sondern "progenia" heissen, da griechisch das Kinn γένειον und nicht γέναιον heisst, wie Meyer auf S. 96 des im Jahre 1868 erschienenen I. Bandes vom *Archiv für Psychiatrie* angiebt, und immerfort überall "progenæa" gebraucht, wonach also ein Druckfehler ausgeschlossen werden muss.

Also diese "Crania progenia" können ohne eingehendere Prüfung leicht—wie es wirklich auch schon in der Literatur vorgekommen ist—durch ihren Namen, nämlich durch die Bezeichnung, "mit vorstehendem Kinne" (προγένειος) zu dem Glauben führen, dass Meyer hiemit immer solche Schädel bezeichnen wollte, wobei die untere vordere Zahnreihe vor die obere beisst. Dieses ist indessen für Meyer wohl ein hervorragendes, jedoch nicht absolut essentielles Merkmal dieser Schädeltypen, wie das nach seinen einzelnen Beobachtungen, so z. B. nach Beobachtung Nr. 6, S. 101, Nr. 7, S. 102, Nr. 8, 9, 10, S. 103 und Nr. 11, S. 104, l. c. zu ersehen ist.

Somit sind eigentlich die "Crania progenia" von Professor Meyer in keinerlei Zusammenhang mit dem "Mordex prorsus" Carabelli, und also nicht hieher gehörig.

Contour Restoration of the Superior Central Incisors.

Dr. E. Parmby Brown, New York.

Statistics taken by two dentists, extending over about ten years, in their daily practice in remote localities from each other, accounts of which appeared in a dental journal some time ago, harmonized in one particular—that the upper central incisors were more liable to decay than any other teeth. My own observations lead me to believe the correctness of the statement. The first caries appeared there in my own mouth, the first fillings there inserted by hand pressure and non-cohesive gold, by one of the leading dentists in New York City, in two or three years failed, only to be repeated the same way, with the same failure soon following. Then came the loss of one pulp, the loss of the corner of the tooth—the corner restored by wooden mallet with sponge gold—broken off in one year; replaced and broken off again in one year; work done by another New York dentist—the best I knew of. Another expert operator chosen—graduate of Phila. College: corner replaced with cohesive foil and 6,700 blows of the lead mallet. Stood seven years; then tooth and gold shaft entering the nerve channel, snapped off while eating, leaving only a pulpless root behind. The two original fillings of hand pressure and non-cohesive gold failed, probably for want of thoroughness and lack of the means of those days to save more than a small percentage of teeth worked at. Failure of the two corners restored by sponge or crystal gold, due to poor material for such work, to improper mode of operating, and to defective adaptability of gold to tooth substance. Last corner, by foil and lead mallet, failed in seven years, on account of improper mechanical union of gold to

enamel at cutting edge, which by crumbling of the enamel at the point of contact with the gold, and the gradual forcing away of the gold by the rotary action of the jaws during mastication, permitted the decaying influence to make progress.

We may have seen many failures; there are many. They come from three causes:—

1st. Not knowing how to do them.

2nd. Not doing them thoroughly when knowing how.

3rd. Not using good gold and proper appliances when capable of performing them.

Some men may be able to build up a golden incisor with hand pressure; but how many can do it, and do do it successfully and profitably? Not one! I venture to say, and challenge contradiction.

The secret of the greatest success, in this line of operating, is a great number of light and rapid blows, in harmony with tooth structure and the living organism to be operated on.

Dr. Atkinson and I timed and counted the malleting then in progress by his student. Finding that nearly one hundred thousand blows could be struck on a gold filling in a single day, by a hand-mallet, I deduced from the experience of the heavy lead mallets (6,700 blows on my own tooth), that I would prefer to take more of them, and take them lighter and livelier. I preferred to take, say three times as many, one-third as heavy, and have them laid on three times as fast. And how to accomplish this has been my earnest study. Since then we have counted fifty thousand blows on a single filling, occupying five hours. We—by means of a steel mallet—lately had occasion to replace a large corner on central incisor, pulp alive, for New York City Dentist, which had failed five times—the last time operation done by college graduate—taking five hours to perform; and was broken off entire at the supper-table, the first meal eaten after it was put in. Two years ago a dentist, from New Jersey, had two golden corners put, on his central incisors, at the New York Clinic, by the heavy lead mallet. One year after, he showed me, at the same place, a pivot tooth, where one tooth was, and a score of nicks on the enamel margins of the other corner, where the great force of the blows had bruised the tooth. Contour restoration has, for more than fifteen years, been particularly attractive to me, which has led to making it somewhat of a speciality; and I have built up on incisor teeth, in the last twelve years, upwards of three thousand of these fillings, with the gold running to the cutting edge of the teeth. This makes about five a week only, or less than one a day—when I sometimes do several, and, on one occasion, as many as five, in one day. And, to balance this, several days may pass without any of that class of work.

The record says that less than thirty of these fillings have failed, as far as known. Careful examination of causes of failures prove that the principle is a success, and that the failures were due to reasons which can be avoided as a rule; improper anchorage, improper condensation of gold, imperfect margins, &c. I can think of many mouths where many tooth restorations have stood upwards of ten years, and not a defect has come—mouths of young and old; teeth with and without pulps living—teeth of both good, bad, and indifferent structure.

Suppose the failures to be ten times greater than ascertained, by some patients moving away, or not reporting, this would only make a ten per cent. failure running twelve years, which would be as good as any class of fillings in the teeth.

The author then proceeded to elucidate by means of models and diagrams various minutiæ which would be unintelligible without figures.

Dental Surgery in the Army.

Mr. Thomas Gaddes, London.

Cognisant of the notable fact that the executive of the International Medical Congress have, for the first time, so recognised dental surgery as to set apart a special Section for that branch of surgery, likewise that this Congress is scientific, not only in the common acceptation of the term, but scientific also in the medico-social sense, it may not be inopportune to solicit the opinion of this Section—so weighty and so influential—upon the question of Dental Surgery in the Army.

The regular forces of the British army consist of 191,000 men; the average number abroad being 103,000; the average number at home, 88,000.

For this great number of men, who are the units of Her Majesty's power, there is provided a specially trained and examined medical staff. The special subjects of study and examination of the Army Medical Department are Medicine, Surgery, and Hygiene. Therefore, we may infer that the health of the soldier is the immediate consideration of that department.

I need not, before this Dental Section of the International Medical Congress, set forth the relation of the teeth, and the importance of dental surgery to the general health. Their association is too well known, not only to the specialist, but also to the observing physician and surgeon. Yet, in the face of these facts, the army medical officers have not to receive, neither, as a rule, do they obtain, any instruction or experience in the treatment of the common, and often very painful, diseases of the teeth.

In 1858 the Royal College of Surgeons of England recognizing the special nature of dental surgery, and the inadequacy in this respect of the education for the fellowship and membership of the College, instituted a specific dental curriculum, examination and diploma. Furthermore, the Council of this College decided not to accept the signatures of teachers of dental surgery unless they possess the license in dental surgery—the certificate of a fellow or member only is not recognized. The speciality of dentistry has also been recognized by the Royal College of Surgeons of Edinburgh and in Ireland, and by the faculty of Glasgow. These bodies, under the powers of the Dentists Act, 1878, have adopted the dental curriculum recommended by the General Medical Council, and now hold examination and grant degrees in dental surgery. By the Parliament of 1878, by the General Medical Council, by the Royal College of Surgeons of England, and the other surgical corporations, has the necessity for, and the special nature of, dental education and examination been sanctioned. Yet dental surgery is totally ignored, and enters into no part of the special training required by the Army Medical Department. The result of this is that the non-commissioned officers and men of the British army receive from the Army Medical Service, as a whole, such treatment as must, from the nature of the case, be far inferior to the skill in medicine, surgery, and hygiene, displayed in the highest degree by members of that service. And, where treatment for diseases of the teeth, from which of a certainty nine-tenths who are sufferers, is not given by the army surgeon, relief is not unfrequently sought and obtained at the hospitals of the charitable, maintained for the necessitous poor only. Furthermore, how many teeth are lost which might, in these days of conservative dental surgery, be saved? How much suffering before their loss, and also after their loss, is endured by the brave-hearted, for the want of the administration in the army of an organized system of dental surgery?

That there is a necessity for such an administration all must agree; but the question how such is to be accomplished will require careful consideration.

Several members of the Army Medical Service, wishing to improve their knowledge

and skill in dentistry, have attended the special course of instruction at certain of the dental schools, and have qualified themselves by taking the diploma in dental surgery. Though these are very exceptional instances, they indicate the feeling of want of knowledge in dental matters, which is truly the general feeling of the Army Medical Service.

In October, 1859, there was presented to the Military Department of the Madras Government, a Report on Dental Surgery, by Acting-Garrison-Surgeon H. W. Porteous. That Report showed that the Honourable the Governor in Council had, in May, 1859, under his consideration the fact of the European soldiery being inadequately provided with any dental assistance, beyond extracting teeth when the cause of toothache: That it was resolved—"A medical officer in every European regiment be instructed in Dental Surgery." That "The Commander-in-Chief is requested to issue such subsidiary instructions on the subject as his Excellency may consider necessary for giving it effect."

Dr. Porteous at once made arrangements for carrying out, in H.M.'s 44th Regiment, stationed in Madras, the provisions of the former resolution. Practical instruction was given by him to the assistant-surgeons twice a week. For one group of 66 patients, 108 teeth were stopped, and 203 roots extracted. The success of the system pursued was, in that instance, so far satisfactory that it was only necessary to extract three teeth, "two of these on account of alveolar abscess, and one in which the filling had induced more irritation than the patient was inclined to bear." The Report continues—"By the extension of the present system of instruction in dental science to assistant-surgeons of the army generally, it is hoped that the practice of extracting every aching tooth will be reduced to within the narrowest limits, and that the arrest of decay in teeth soon after its detection will be the means of preserving many of our soldiers' teeth which, under the present system, are sacrificed whenever they begin to be painful and troublesome."

In March, 1857, the Director-General of the Army Medical Department issued a circular to the Medical Officers of the Service. In that circular Director-General Dr. A. Smith instanced the advances made in Conservative Dental Surgery, and said, "There is no occasion for me to enlarge on the important influence, advantageous or the reverse, on the functions of digestion and nutrition which the sound or defective condition of the teeth exercises; and I need not dwell on the fact that their conservation is especially of consequence to soldiers, as their absence or defective condition found a very possible cause of impaired digestion and consequent loss of health; and, moreover, occasionally constitute a direct cause of inefficiency and unfitness for military service. . . . .

"I am of opinion that a considerable gain to the Service, besides comfort to individuals, would accrue from a more improved practice in dental surgery than that which has hitherto obtained in military life. . . . .

"I therefore hope that medical officers of the Service will co-operate with me in endeavouring to introduce into military medical practice the improved modes of treatment, now all but universally adopted in civil life."

In reply to the above-quoted circular of the Director-General, the medical officers pointed out that they had not received any practical instruction in a branch so absolutely requiring it, and that they were not supplied with the requisite instruments.

Notwithstanding the success which attended Dr. Porteous' experiment of two seasons, and the valuable support this excellent movement had in Sir Charles Trevelyan, at that time Governor of Madras, and of the Director-General of the Medical Department, the Government took no action.

In 1865 Surgeon-General Balfour was requested to inquire into and report upon the health of the troops, stationed at the extensive barracks at Secunderabad. In an exhaustive letter of December 26, 1866, he stated that instances occurred of impaired

assimilation from imperfect mastication, and a good dentist would preserve the teeth of many soldiers.

Defective teeth are a cause of rejection among recruits, and it may be interesting to mention the numbers refused from this cause during eight years :—

1871	12·54	per 1,000 recruits.
1872	8·07	
1873	7·62	
1874	5·86	
1875	6·03	
1876	7·07	
1877	8·93	
1878	9·60	

In passing the recruits the medical officers have to examine the condition of the teeth ; and, certainly, there cannot be required any argument to substantiate the statement that such an examination would be better effected if the examiner had the benefit of special dental instruction and experience.

To meet the requirement of a better administration of dental surgery in the army than has hitherto existed, the most feasible means would be to impart to the army medical candidates special instruction. This might be done by a systematic course of lectures, and of operative work, to be included in the subjects of study at Netley ; and, finally, let the pass examination include questions, and, above all, practical work in dental surgery.

Antrum of Highmore—Diseases and Treatment.

Dr. Taft, Cincinnati.

Diseases.

The most simple form of affection to which the antrum is subject, is engorgement by watery or muco-serous effusion. This will take place when the canal leading from the cavity is closed.

The presence of an excess of the secretion doubtless stimulates the membrane to a more than normal activity. This state of things may exist, and still a definitely diseased condition may not occur. The only indications of this affection, in the earlier stages at least, will be first a slight increase in weight in the part; and after the cavity is completely occupied, a sense of fulness and pressure; this will be modified by the activity of the secreting process within, together with the irritability of the parts pressed upon.

This engorgement often produces expansion of the cavity by pressing outward one or more of the walls; the weakest or thinnest being susceptible of course to the greatest displacement. In some cases the anterior, or facial, wall is so much thinner and less resistent than any of the others, that it, only, is pressed outward, so that marked protrusion of the cheek is presented.

The contents of the antrum, during this affection, will vary in different cases. In some it will remain for a long time in apparently an unchanged condition, without offensive odour, change of colour, consistence, or vitiation of any kind. But in other cases, and perhaps far more frequently, a more or less marked change takes place, resulting in a vitiated, acrid and offensive state of the contents.

This may occur from the presence of local vitiating influences, such as diseased gums,

alveolar abscess, or the diseased roots of teeth, that may be in near proximity to, or perforate the floor of, the antrum.

But more frequently the vitiated condition of the accumulation is occasioned by, and is dependent upon, a systematic cachexia, or low tone, defective nutrition, or a tendency to degeneration.

If the membrane is much diseased the secretion will be correspondingly affected, and, on the other hand, as this product becomes vitiated, it increases the disease of the membrane.

Treatment.

In all cases of engorgement the natural outlet is closed, but this may be only incidental, and disappear at once upon the evacuation of the chamber. In some cases it is otherwise, however, and the engorgement will be found to have originated from closure of this canal in one of the ways already referred to.

In such a case, if the teeth are all present and free from disease, the attention should be directed to opening the canal, by the removal of any accumulation upon or within its orifice, and by bringing to a normal condition the lining membrane of the nose.

If by this means the opening is not effected, a properly formed instrument may be passed through the canal, and in this way break up any adhesion, or remove any obstacles that might exist. The instrument for this purpose should be of such size, form, and elasticity, as not to lacerate or injure the part. This operation has been declared by some to be impracticable, but the facility with which it has been performed, and the good results obtained, fully warrant the statement that it is of much value.

The removal of a sound healthy tooth in order to effect an entrance to the antrum should only be resorted to when no other expedient is practicable.

The canal, from the antrum to the nose, may be opened, in some cases at least, by injecting fluid through the socket of a tooth, but the latter should be kept free so long as drainage is required; when occasion for this ceases, closure of the opening should be effected.

When there is a strongly-vitiated discharge, attention in diagnosis should be directed to the condition of the general system and, locally, to the lining membrane of the cavity, and again to the condition of the bone, especially of that part contiguous to the roots of the teeth; and, lastly, to any affected teeth that might exercise a deleterious influence. If embarrassment in any of these particulars is found, it must be removed or neutralized.

Nitrate of silver, chloride of zinc, sulphate of copper or iron, chromic acid, and sulphuric acid may be mentioned as available local applications.

Over-treatment, with this class of agents, is a too common fault, which must be avoided if the best results are to be attained. It is important, in any case, to determine to what extent the discharge serves as an irritant to the tissue from which it proceeds or with which it comes in contact. This will determine to what extent disinfectants and antiseptics are indicated; there is much less danger from over-treatment with these than with escharotics.

In the regions posterior to the antrum there are many delicate structures whose functions are interrupted or destroyed by disease occurring in the antrum. Among these are the contents of the spheno-maxillary fossa; in this space lies the spheno-palatine, or Meckel's ganglion. Sometimes disease occurs in this structure which requires operative interference. Important nerves pass to and from this ganglion. The superior maxillary nerve, as it emerges from the foramen rotundum, crosses this space at its upper part. These structures, delicate and sensitive, can hardly remain free from disturbance and functional derangement, with disease in such close proximity as the antral cavity affords.

Cerebral disease has originated in disease of the antrum with the most serious, even fatal, results.

On the Premature Loss of Teeth by Destruction of their Alveoli.

The discussion was opened by Dr. J. WALKER, London, who exhibited a number of sections: amongst others were some taken from the jaws of an aged dog, whose teeth were loosening; the conclusion arrived at being that, in the present state of pathological knowledge, no distinction could be traced between the loss of a tooth-socket prematurely by disease, its absorption after an extraction, or its wasting in old age, the microscopic characters being identical. In support of this view, reference was made to diagrams and specimens enumerated below.

No. 1.—A vertical section of a temporary tooth, taken immediately after extraction, with adherent membrane showing multi-nucleated cells, these forming excavating cavities in the cementum of the fangs. Nos. 2, 3, 4, 2nd series.—Vertical sections of the lower maxillary bone, showing the normal repair and absorption of the walls of the socket, after the extraction of a sound, healthy tooth. Nos. 3, 4, section made after a longer lapse of time after extraction.

No. 5. A socket healing after extraction showed:—

(i.)—Tissue stretching from side to side, at the apex of the socket; a simple cell-growth of adhesive inflammation.

(ii.)—On the sides and at the base of the socket, bone laid down from the osteo-genetic layer of the periosteum.

(iii.)—Multi-nucleated cells, generated by the osteo-genetic layer of the periosteum of the outer and superior walls of the socket—excavating cavities in the upper walls of the socket just like cavities excavated on the fang of a temporary tooth.

(iv.)—The vascular and nerve element in the base of the socket.

No. 6.—Sections of canine tooth, and vertical sections of lower maxillary bone, showing the pathological changes in the muco-periosteal membrane and alveolar process from congested, inflamed, and receded gum. The conspicuous points were—

(i.)—The loss of vascularity; the increase of white fibrous tissue.

(ii.)—Subacute inflammation passing into depths of the alveolar processes adjacent to the inflamed gum.

No. 7.—Section of diseased bone of tibia; subacute inflammation passing from bone to cartilage in irregular inflammatory areas.

The points suggested are these: Have the multi-nucleated cells, in normal repair of bone, the power of secreting acid, and so acting on the tissue of the bone, and, as they increase in size, excavating large cavities? Is the fibroid condition of the receded gum a development of the fibrous layer of the periosteum; and, by inanition from the loss of the vascularity of the membrane, does death to the alveolar walls ensue?

Dr. J. ARKÖVY, Buda-Pesth: The subject which is now under discussion has been my subject of inquiry for more than four years; and, lately, I have come to a certain conclusion. I am going to publish my inquiries, and now I wish to draw your attention only to one single point of the pathology of the disease. I have found—by examining the pus of that so-called Riggs's disease, or pyorrhœa alveolaris, &c.—that there constantly occurs a certain fungoid formation, which I found to be in close connection with the wasting of the alveoli and the gingival margin, as well as the subsequent loosening of

the teeth; it is quite different from leptothrix buccalis, although it is in a developmental relation with it. Such pus, when made free by treatment—which I do not refer to now—from any other fungoid formation, except spherobacteria (Cohn) imbedded in glue, was placed in a watchglass full of water, with sugar and a small quantity of meat, and produced, after 48 hours, at a temp. 37–38° C., leptothrix, and, in 7 days, the same mycelium-like formation which was originally in the pus, giving an evidence that spherobacteria, under favourable circumstances—and perhaps only in the mouth—produces leptothrix, and under still better circumstances, as afforded by the gingival margin and the alveolar wall—lead to the production of a more complicated form of fungi, the species of which I hope to be able soon to classify. As to the rest of the etiological question, there would be yet much to say; but the limited time does not permit me to dwell upon the subject any longer.

Dr. Joseph Iszlai, Buda-Pesth: I have also investigated pus of alveoli affected with the so-called Riggs's disease, and found very similar forms to those drawn by Dr. Arkövy. As far as a judgment can be formed of Dr. Arkövy's present figures, without the original microscopical preparations, I think they can be explained as a species of "Schimmelpilz," for instance, partly of mucor mucedo, partly of penicillium, and other mixed spores and threads of leptothrix buccalis, which can often be found in the mouth. The exact species could only be determined on inspecting the original preparations. I found still other forms than those of Arkövy's, but on a strict examination they always have been found to be a part or form of well-known mycetes. I am therefore of opinion that also the forms drawn here by Dr. Arkövy might be parts, forms, or species of known mycetes. Without a very exact study of mycology it is not possible to decide on a causal connection with Riggs's disease.

Mr. Walter Coffin, London, explained that his father's successful treatment of this disease had been, in his opinion, the supplementing of a removal of mechanical irritation and conditions retaining disease, by a very thorough antiseptic treatment with phenylic hydrate (strongest liquid carbolic acid), applied locally only, and very exactly, to the positions of purulent discharge between the tooth and its sockets and the gum. He believed that Riggs's surgical treatment bore to this about the relation that the cleanly treatment of wounds bore to real antiseptic surgery. The peculiar chemical reaction of phenylic alcohol with the tissues, saturated by the particular discharge of this disease, fully confirmed, in his opinion, the septic theory of its origin, whether associated or not with the predisposing or aggravating influences of necrosis, calculus, or other causes.

Mr. Oakley Coles, London, drew attention to the fact that the early stages of so-called Riggs's disease, is due to separation of the margin of the gum from the neck of the tooth, the result of local inflammation, thus forming a pouch for the lodgment of foreign bodies.

Dr. Atkinson, New York: That there must be constitutional debility to promote the establishment of "pyorrhœa-alveolaris" in any case he held to be sound, and that there was a mode of degeneration of that attachment or connective portion of the gum to the neck of the tooth which is not worthy of the name "ligamentum dentium" he was very certain was true. That there was atrophy of this, allowing a recession of the margin of the soft parts surrounding the edge of the alveolar processes, was a matter of observation to every careful dentist. He attributed that entirely to constitutional,

aggravated by local, instigation—stiff brushes foolishly used in a manner to tear the gum from the tooth. Brushing the lower teeth longitudinally downwards, and the upper-teeth longitudinally upward, had a tendency to tear away the connection so vital to the safety of the tooth. Wherever a reproduction of any of those structures was desirable, it was important to have a pocket to hold the pabulum in the place where the structure is desired to be reformed; and in every case he would advise the use of at least no weaker a solution of chloride of zinc, than twenty grains to the ounce of water.

Mr. C. S. Tomes, London, related a case of a patient, aged 25, in which all remaining teeth were extracted at the patient's urgent desire; on many of the teeth distinctly affected there was not a trace of tartar.

Dr. Snow, Hartford, Connecticut: Sixteen years of constant observation at the chair of Dr. Riggs, warrants me in making the statement that Riggs' treatment of the disease is a sure cure; will completely eradicate the disease and restore health. "Riggs' disease should be called Riggs' treatment, not Riggs' disease." To a great extent the disease is the result of neglect and the lodgment of foreign substances on the teeth, causing the absorption of the alveolar process and final loss of the whole denture. It requires fine manipulation and years of practice to be able to treat the cases successfully.

Dr. Friedrichs, New Orleans: As the treatment of this disease has been given, I purpose to give the prophylaxis, but before proceeding, I will state that I differ from the statement made by a previous speaker that it requires an incipient degree of inflammatory separation before tartar would be deposited. Now it is well-known and patent to every dental surgeon, that on examination of any patient's mouth, who masticates but on one side, that he will find tartar deposited on some of the teeth on the opposite side, and the mouth being in a healthy condition. The prophylaxis is cleanliness. I contend that, where the teeth are kept perfectly clean, no tartar will be deposited and no Riggs' disease will be developed.

MENTAL DISEASES.

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INAUGURAL ADDRESS,

BY THE PRESIDENT,

Dr. C. LOCKHART ROBERTSON,

Lord Chancellor's Visitor in Lunacy.

Gentlemen,—In now opening the eighth Section of this great International Medical Congress, and in offering to the alienists of Europe and America our cordial welcome to London, I must ask leave to explain to you that it is only by the accident of official position as senior physician to the Lord Chancellor, who, under the Royal prerogative and by statute, has in England the guardianship of all lunatics and persons of unsound mind, that I occupy to-day this presidential chair. But for the desire of the Executive Committee thus to recognize the paramount authority of the Lord Chancellor in our department of medicine, I cannot doubt that the place I now fill would have been allotted to our most distinguished English writer on lunacy, Dr. J. C. Bucknill, one of the vice-presidents of this Congress, whose writings and whose name are a household word in all the asylums where the English tongue is spoken. Called from my official position, rather than from personal fitness, to preside in this Section, I may the more venture to ask at your hands a generous interpretation of my efforts, so to guide your deliberations here, that they may advance the science and practice of this department of medicine in which we are all enrolled.

I think I shall best use this occasion by laying before you a brief statement of the present condition of the insane in England, and of the manner and method of their care and treatment. In the German tongue the word *Irren-Wesen* exactly expresses the subject of this address.

The number of the insane in England of whom we have official cognisance is about 71,000, being in the ratio of 27·9 per 10,000, or 1 in 350, of the population. Of these no less than 63,500 are paupers chargeable to the rates and maintained at the cost of the community. The remaining 7,600 are private patients, whose means vary from £50 to £50,000 a year, much the larger number being nearer £50, for insanity necessarily tends, by arresting the power of production, to the impoverishment of its subjects. Thus, of the total of the insane in England, 90 per cent. are paupers maintained at the public cost, and 10 per cent. only are kept by their own resources.

There has, since the passing of the Lunacy Act of 1845, been a great yearly increase in the registered numbers of the insane, an increase chiefly, if not solely, among the pauper class, which admits of satisfactory explanation, as I have elsewhere* endeavoured to show, without accepting the popular fallacy of an increase of insanity; a theory which, if carried to its logical conclusion, leads us to the result that as the registered lunatics in 1845 were as 1 to 800 of the population, while in 1880 they stand, as I have just stated, as 1 to 350, therefore lunacy in England has more than doubled during the last thirty years, which is a manifest fallacy. I only regret that my present limits preclude farther reference to this interesting problem.†

My first table exhibits the number of the insane in England, with their place of residence and their proportion to the population in the decenniums 1860, 1870, and 1880. This table shows that the total registered number of the insane has risen from 38,000 in 1860, to 71,000 in 1880, and the ratio to the population from 19·1 per 10,000 to 27·9. It is evident from my figures that this increase is mainly in the pauper class. The private patients in 1860 numbered 5,065, in 1880 they were 7,620, and their ratio to the population 2·5 and 2·9 respectively, an increase of ·4 only, as compared with the increase of 8·4 among the pauper lunatics, on each 10,000 of the population.

TABLE I.—*Showing the number of Lunatics in England and Wales in the several Decenniums* 1860, 1870, 1880, *with their Place of Residence and their Proportion to the Population.*

Where detained (Place of Residence)	1860			1870			1880		
	Private	Pauper	Total	Private	Pauper	Total	Private	Pauper	Total
In Public Asylums .	2,000	17,442	19,442	2,780	28,229	31,009	3,754	39,986	43,730
In Private Asylums	2,948	1,352	4,300	3,144	1,760	4,904	3,398	1,141	4,549
In Workhouses . .	None	8,219	8,219	None	11,358	11,358	None	16,464	16,464
In Private Dwellings	117	5,980	6,097	356	7,086	7,442	468	5,980	6,448
Totals . . .	5,065	32,993	38,058	6,280	48,433	54,713	7,620	63,571	71,191
Ratio per 10,000 of the population	2·54	16·58	19·12	2·79	21·52	24·31	2·99	24·95	27·94

* The Alleged Increase of Lunacy: *Journal of Mental Science*, April, 1869. A Further Note on the Alleged Increase of Lunacy: *Journal of Mental Science*, January, 1871.

† In the Report of the Scotch Commissioners in Lunacy for 1880, this question of the apparent increase of insanity is ably discussed and dealt with in a careful statistical inquiry. I can only here give their conclusion. "We have frequently pointed out that

Table II. gives the distribution per cent. of the 71,000 registered lunatics in England and Wales, and I have here contrasted the same with that of the 10,000 lunatics registered in Scotland.

TABLE II.—*Showing the Distribution per cent. of all Lunatics in England and Wales and in Scotland in* 1880 (*January* 1*st*).

Where Maintained.	Distribution per Cent.					
	In England and Wales			In Scotland		
	Private	Pauper	Total	Private	Pauper	Total
In Public Asylums* .	5·0	56·5	61·5	14·6	61·0	75·6
In Private Asylums† .	5·0	1·5	6·5	1·6	None	1·6
In Workhouses‡ . .	None	23·0	23·0	None	7·0	7·0
In Private Dwellings§	·5	8·5	9·0	1·1	14·7	15·8
Total . . .	—	—	100	—	—	100

TABLE III.—*Showing the Distribution per cent. on their several Numbers, of the Private and Pauper Lunatics respectively in England and Wales and in Scotland in* 1880.

Where Maintained.	Distribution per Cent.			
	In England and Wales		In Scotland	
	Private	Pauper	Private	Pauper
In Public Asylums	49·0	63·0	84·0	73·7
In Private Asylums	43·0	1·6	9·5	None
In Workhouses	None	26·0	None	8·5
In Private Dwellings	8·0	9·4	6·5	17·8
Total	100	100	100	100

Table II. is interesting as contrasting the total distribution of lunacy in England with that of Scotland. In England 61·5 per cent. of the lunacy of the country is maintained

the difference in these rates of increase is not necessarily due to an increasing amount of mental disease, but is probably due in a large measure to what is only an increasing readiness to place persons as lunatics in establishments."

* Including county and district asylums and Scotch parochial asylums, lunatic hospitals, and Scotch chartered asylums, naval, military, and East India asylums, idiot asylums, Broadmoor Criminal Asylum, and Perth Prison wards.

† Including provincial and metropolitan licensed houses.

‡ Including the metropolitan district asylums.

§ Including 208 Chancery lunatics residing in the private houses of "the committee of the person."

in the public asylums. In Scotland it reaches 75·6 per cent., while, on the other hand, the proportion of patients in private asylums is 6·5 per cent. in England as against 1·6 in Scotland. In England 9 per cent. only of all lunatics are placed for care in private dwellings; in Scotland the proportion rises to 15·8. In England we have 23 per cent. in workhouses; in Scotland there are only 7 per cent.

Table III. gives the relative distribution per cent. of private and pauper lunatics respectively in England and Wales, and in Scotland.

Table III. brings strikingly before us the existing difference in the method of care and treatment of the insane in the two kingdoms. In England 43 per cent. of the private patients are in private asylums, while in Scotland the proportion is 9·5 only. The public asylums, on the other hand, have 84 per cent. of the Scotch private patients under treatment as against 49 in England. In England, owing to the traditional preference of the Court of Chancery for private dwellings for the care of its wards, we find the proportion of patients so placed stands as 8 to 6·5 in Scotland, while with pauper lunatics these figures are reversed, the proportion in England being 9·4 as contrasted with 17·8 in Scotland.

I. Public Asylums.

There are 43,700 patients in the public asylums of England, or 61·5 per cent. of the whole lunacy of the country. Of these 40,000 are pauper lunatics, and 3,700 are private patients. The former are maintained in the county and borough asylums, the latter are divided between these and the registered lunatic hospitals.

(*a*) *County and Borough Asylums.*—The sixty county and borough asylums of England * contain 40,000 beds, the number in each varying from 2,000 to 250. They have been built and are administered under the provisions of the Lunacy Act of 1845. The average cost per bed has been under £200; the weekly maintenance of each patient is 10*s*., to which must be added the interest on the cost of construction and the yearly repairs of the asylum, which are borne by the county rate, bringing the yearly cost for each pauper lunatic maintained in the county asylums to nearly £40.

The government of the English county asylums is entrusted, by the Lunacy Act, 1845, to a committee of the justices of the peace, under the control of the Secretary of State for the Home Department. The administration is in the hands of the resident medical superintendent. A yearly inspection of the asylum is made by the Commissioners in Lunacy, and a yearly medical and financial report is presented by the committee and medical superintendent to the quarter sessions, and published.

The proportion of cures (discharged recovered) in the county and borough asylums in the last decennium, 1870–80, was 40·28 per cent. on the admissions, and the mortality 10·59 on the mean population. In Scotland, during the same period, the recoveries were 41·6, and the deaths 8·0. The only private patients admissible under the statute are those bordering on pauperism, and whom the law requires, as to classification, diet,

* A return was ordered by the House of Commons to be printed, Aug. 14th, 1878, of the cost of construction of each of the county asylums, the number of beds, the annual and weekly maintenance rate, the percentage of recoveries, deaths, &c. Unfortunately it has been, as regards England, carelessly prepared, and no abstract or summary of its contents or averages are given. It is impossible to make out clearly in which asylum the yearly repairs are included in the total cost of construction and in which they are omitted. The quarter sessions of Warwickshire have made no return at all! In contrast, in the same Parliamentary paper, stand the clear tables and summary relating to the public asylums of Scotland. From the English return we can only gather an approximate estimate of the cost of construction, amount of land, salaries, cures, &c., no averages being given.

clothing, &c., to be treated as the paupers. Herein the English county asylums differ from those on the continent of Europe and in America, where alike, and I think most wisely, special and often excellent provision exists for the care and treatment of private patients. At the public asylums near Rouen, at Rome, at Munich, and at Utica, in the States, I have seen extremely good accommodation provided for private patients.

In Mr. Dillwyn's Lunacy Law Amendment Bill, 1881, which was read a second time on May 25, but has since been withdrawn for this session, there was a clause (section 4) enabling the visitors of county asylums to provide there suitable accommodation, by additional buildings or otherwise, for private patients. I regard this proposal as one of the most important reforms, since the Lunacy Act of 1845, in the treatment of the insane of the middle class, providing as it would for the small ratepayers, at a cost within their means, such care and treatment as they cannot obtain in the cheaper private asylums, where the accommodation and comfort are absolutely below that of the county asylums, not to refer to the superior acquirements of the medical superintendents of the latter.

I do not feel called upon from this chair (nor does time admit) to enforce and illustrate the now incontestable superiority of public asylums, even in a financial point, for the curative treatment of the insane poor as contrasted with the private licensed houses, to which, before the Act of 1845, they were farmed out by their respective parishes.

"Our present business is to affirm that poor lunatics ought to be maintained at the public charge. I entertain myself a very decided opinion that none of any class should be received for profit; but all, I hope, will agree that paupers, at any rate, should not be the object of financial speculation." These words, spoken by Lord Shaftesbury in the House of Commons, when he introduced the Lunacy Act of 1845 (the Magna Charta of the insane poor), settled this question once for all. Whose voice will speak similar words of comfort and healing to the insane of the upper and middle classes, and declare with authority which shall no longer be questioned, "that all insane captives whose freedom would not be dangerous should be liberated, and those who remain be surrounded with every safeguard of disinterestedness, humanity, and public responsibility"?

In here recording the success which has attended the Act of 1845—a success that led my friend Dr. Paget, in his Harveian Oration, to call the site of one of our English county asylums "the most blessed manifestation of true civilization that the world can present"—I cannot refrain from adding a word of tribute to the memory of my revered friend John Conolly, whose work of freeing the insane from mechanical restraint, and of thereby founding our English school of psychological medicine, preceded the legislation promoted by the Earl of Shaftesbury, and ensured the success of these enactments.*

* "In June, 1839, Dr. Conolly was appointed resident physician at Hanwell. In September he had abolished all mechanical restraints. The experiment was a trying one, for this great asylum contained 800 patients. But the experiment was successful; and continued experience proved incontestably that in a well-ordered asylum the use even of the strait-waistcoat might be entirely discarded. Dr. Conolly went further than this. He maintained that such restraints are in all cases positively injurious, that their use is utterly inconsistent with a good system of treatment; and that, on the contrary, the absence of all such restraints is naturally and necessarily associated with treatment such as that of lunatics ought to be, one which substitutes mental for bodily control, and is governed in all its details by the purpose of preventing mental excitement, or of soothing it before it bursts into violence. He urged this with feeling and persuasive eloquence, and gave in proof of it the results of his own experiment at Hanwell. For, from the time that all mechanical restraints were abolished, the occurrence of frantic behaviour among the lunatics became less and less frequent. Thus did the experiments of Charlesworth

workhouses contain 16,500 pauper lunatics, or 26 per cent. of their number. A recent statute facilitates the adaptation of wards in the county workhouses* for the reception of lunatics; and if these arrangements were properly carried out, I think another 14 per cent., or 40 per cent. of the incurable and harmless pauper lunatics and idiots might be provided for in the workhouses. That this is no fancy estimate I may quote the parish of Brighton, long distinguished for its wise and liberal administration of the Poor-law, which has already 36 per cent. of its insane poor in the workhouse wards, and 55 per cent. only in the county asylum. The transfer of twenty chronic cases—no impossible feat—from Hayward's Heath to the Brighton workhouse wards would at once bring the Brighton statistics up to my ideal standard for the distribution of pauper lunatics—viz., in county asylums, 50 per cent.; in workhouse wards, 40 per cent.; leaving 10 per cent. for care in private dwellings.

(*b*) *Lunatic Hospitals* (*Middle-class Public Asylums*).—Besides the county asylums for the insane poor, we have in England fifteen lunatic hospitals, including the idiot asylums at Earlswood and Lancaster, where the principle of hospital treatment followed in the county asylums is applied to the insane of the upper and middle class with the most satisfactory results.

The following table gives a list of these asylums, with the date of their foundation, their present accommodation (number of beds), and their average weekly cost of maintenance:—

TABLE IV.—*The Registered Lunatic Hospitals* (*Middle-class Asylums*) *in England, with the Date of their Foundation, the Number of Beds, and the Average Weekly Cost of Maintenance in* 1880.

Name and Site of Asylum (Registered Hospital)	Date of Foundation	Number of Beds	Average Weekly Cost†		
			£	s.	d.
Bethlem Royal Hospital	1400	300	1	11	7
St. Luke's Hospital	1751	200	0	19	3
York Lunatic Hospital	1777	160	1	1	1
Friends' Retreat, York	1792	150	1	12	6
Wonford House, Exeter	1801	100	1	11	0
Lincoln Lunatic Hospital	1820	60	1	8	2
Bethel Hospital, Norwich	1825	70	0	15	2
Warneford Asylum, Oxford	1826	70	1	2	7
St. Andrew's Hospital, Northampton ...	1836	300	1	10	1
Cheadle Asylum, Manchester	1849	180	2	2	0
The Coppice, Nottingham	1859	70	1	10	4
Coton Hill, Stafford	1854	150	1	12	10
Barnwood House, Gloucester...	1860	110	1	14	3
Earlswood Idiot Asylum	1847	570	0	18	2
Albert Idiot Asylum, Lancaster	1864	350	0	14	0

These asylums have nearly 3,000 beds, and the average weekly cost of maintenance is £1 10*s*., or, including the fabric account, £1 15*s*.

* The success of the metropolitan district asylums at Leavesden, Caterham, and Darenth, which contain 4,470 chronic lunatics, maintained at the rate of 7*s*. a week, shows how, even in so difficult a place as London, the treatment of chronic and harmless pauper lunatics in workhouse wards is to be accomplished, with a large saving to the ratepayers and a relief to the crowded wards of the county asylums, which are thus made available for the curative treatment of acute and recent cases.

† The fabric charges are not included in these figures. Another 5*s*. a week must be added to complete this estimated weekly cost of maintainance.

There are 7,828 private lunatics registered in England, who are thus distributed:—

In registered hospitals	2702 or 36 per cent.	In public asylums 49 p. c.
In county asylums	484 or 6 ,,	
In State asylums	558 or 7 ,,	
In private asylums	3408 or 43 ,,	
In private dwellings	676 or 8 ,,	

The existing lunatic hospitals, or middle-class public asylums, thus already receive 36 per cent. of all the private patients. The advocates of this method of treatment of the insane, as opposed to the private asylum system, may now fairly say that by thus providing for the care and treatment of 36 per cent. of the private lunatics they have demonstrated the practicability of this method as applicable to the other 43 per cent. now in private asylums.

They can also appeal to the official statistics to show their superiority as regards results over the private asylums. In the last decennium, 1870–80, the average recoveries per cent. on the admissions in the registered hospitals was 46·84; in the metropolitan private asylums it was 30·5; and in the provincial private asylums 34·7. The mean annual mortality during the same period was in the registered hospitals 8·12; in the metropolitan private asylums it rose to 11·01; and in the provincial private asylums it was 8·81. They may, moreover, point to Scotland and say that while in England 49 per cent. of the private patients only are provided for in public asylums, 84 per cent. are so cared for in Scotland. What has been accomplished in Scotland may surely be done in England. And, certainly, as their strong and final argument, they may challenge a comparison of these asylums, conducted at half the cost, with the best of the private asylums in England. We have made arrangements for your visiting Bethlem* and St. Luke's in London, and also the middle-class asylum, St. Andrew's Hospital, Northampton. I should very much like you to see St. Andrew's Hospital, which now contains 300 private patients of the upper and middle classes, from whose payments it derives a revenue of £40,000 a year, of which £10,000 was saved last year for further extensions. It would be difficult to over-praise the power of organization which has enabled Mr. Bayley, the medical superintendent, to achieve this great result in the last ten years only. I can from frequent visitation speak of the order and comfort which reign throughout this asylum.

Mr. Dillwyn's Select Committee, in their Report (March 28, 1878), suggested "that legislative facilities should be afforded, by enlargement of the powers of the magistrates or otherwise, for the extension of the public asylum system for private patients," and in his Lunacy Law Amendment Bill, 1881, read a second time in May, Section 1 enables the justices to provide asylums for the separate use of private lunatics in like manner as the county pauper asylums were built. There can be no doubt, after the experience I have just related of St. Andrew's Hospital, Northampton, that, especially in the populous Home Counties, where no public provision for private lunatics exists, several such asylums, with 300 beds, might be built on the credit of the rates, and would in 30 years repay the capital and interest sunk out of the profits, and without, therefore, costing the ratepayers one penny. This clause alone would have made of Mr. Dillwyn's Bill a great gift to the insane of the upper and middle classes.† I cannot but regret that so valuable a measure had to be withdrawn for want of time. It is already a well-worn complaint

* In the *Journal of Mental Science* for July, 1876, there is a very interesting sketch of the History of Bethlem Hospital since 1400, by Dr. Hack Tuke.

† I brought this whole subject before the Brighton Medical Society in 1862, in a paper on The Want of a Middle-class Asylum in Sussex, subsequently inserted in the *Journal of Mental Science* for January, 1863.

that home legislation is in England sadly impeded by the weary Irish agitation and debates.

Another method of providing public accommodation for private patients was laid by me before Mr. Dillwyn's Select Committee, in a Memorandum on the Establishment of three State Asylums for Chancery Lunatics, signed by Dr. Bucknill, Dr. Crichton Browne, and myself. The insane wards of the Court of Chancery pay upwards of £100,000 a year for care and treatment in private asylums. Certainly no loss could be incurred by the Treasury in advancing sums to build these asylums, where the yearly profits would, as at St. Andrew's Hospital, ensure the regular repayment of capital and interest. As the Court of Chancery controls in every detail the expenditure of the income of its insane wards, it is not an unreasonable demand to require that Court to provide fit public asylum accommodation, and such as the Visitors deem necessary, for the Chancery patients now placed in private asylums, in the selection of which their official Visitors have no voice and over the conduct and management of which they exercise no control.

II. Private Asylums.

There are 3,400, or 43 per cent., of the private patients in England confined in private asylums, of whom 1,850, or 54 per cent., are in the thirty-five metropolitan licensed houses which are under the sole control and direction of the Commissioners in Lunacy, who diligently visit them six times a year. The remaining 1,550, or 46 per cent., are in the sixty-one provincial licensed houses which are under the jurisdiction of the justices in quarter sessions, but are inspected twice a year by the Lunacy Commissioners. I cannot—even did I so desire—avoid, in an address like the present, stating to you my opinion of this method of treatment of the insane. The tenor of my remarks, when referring to the extension of the lunatic hospitals (middle-class asylums), has already shown the direction towards which my opinions and feelings tend. John Stuart Mill, the strenuous advocate of freedom of contract, nevertheless in his "Political Economy," in treating of this subject, observes that "insane persons should everywhere be regarded as proper objects of the care of the State," and, in quoting this authority, I must add, from long personal observation, my opinion that it would be for the interest of the insane of the upper and middle class to be treated as are the paupers in public asylums, where no questions of self-interest can arise, and where the physician's remuneration is a fixed salary, and not the difference between the payments made by his patients for board and lodging and the sums he may expend on their maintenance. "Is there not," writes Dr. Maudsley, "sufficient reason to believe that proper medical supervision and proper medical treatment might be equally well, if not better, secured, by dissociating the medical element entirely from all questions of profit and loss, and allowing it the unfettered exercise of its healing function? Eminent and accomplished physicians would then engage in this branch of practice who now avoid it because it involves so many disagreeable necessities."

Probably all not directly interested in this system, and many who, to their own regret, are so, will concur that, if the work had to be begun anew, the idea of licensed private asylums for the treatment of the insane of the upper and middle class would be, by every authority in the State, as definitely condemned as was in 1845 the practice of farming out the insane poor to lay speculators in lunacy. It is, however, a different matter dealing with an established system, and I am not of those who call for the suppression of all private asylums. The friends of many patients in England distinctly prefer them to public asylums, and some patients, who have had experience of both, contrast the personal consideration and study of their little wants which they receive in private asylums with the discipline and drill of the public institutions. I see no reason

why private asylums should not continue to exist side by side with the public middle-class asylums. Time and competition will show which system shall ultimately gain the approval of the public. I am glad to find this opinion supported by Dr. Arthur Mitchell, Commissioner in Lunacy for Scotland, in his evidence before the Parliamentary Committee of 1877. "I think," he said, "there should be no legislation tending to the suppression of private asylums. I would let the principles of free trade settle the matter. If the public have confidence in private asylums, and encourage them, I would let private asylums exist. I would give them no privileges, and would simply take care that the inspection and control over them are sufficient."

The verdict of public opinion in Scotland has been definitely against the private asylum system. While in England 43 per cent. of the private patients are confined in private asylums, the proportion in Scotland falls to 9·5.

If private asylums are to continue, there should be entire freedom of trade in the business. The Lunacy Commissioners have for many years placed endless impediments in the way of licensing new and small asylums in the metropolitan district. I entirely differ from this policy, and I think that small asylums for four or six patients, licensed to medical men, would tend to lessen the existing evils of the larger private asylums. The monopoly which the Commissioners have established in the metropolitan district has certainly not raised the asylums there to a higher standard than those of the provinces, where free trade in lunacy prevails. I am tempted to say that it has had the contrary effect.

III. The Insane in Private Dwellings.

Further reform in the treatment of the insane is not merely a question of whether and how they shall be detained in public or private asylums, but rather whether and when they should be placed in asylums at all, and when and how they shall be liberated from their imprisonment and restored to the freedom of private life. This is the reform in lunacy treatment which is beginning at last to take hold on the public mind in England, and has received a new impulse by the recent publication of an essay by Dr. Bucknill, "On the Cure of the Insane and their Legal Control." *

It is more than twenty years ago since the question of the needless sequestration of the insane was first raised in England by my friend Baron Jaromir Mundy, of Moravia. He spoke then to dull and heedless ears. I remember well I thought him an amiable enthusiast, and I said there was no fit or proper treatment for the insane to be found out of the walls of an asylum. I have since learnt a wiser experience. Well did he say, on leaving us, *arbores serit diligens agricola quarum fructus nunquam aspiciet*. I am very glad to have this opportunity of doing honour to the zeal and far-seeing wisdom of the first preacher of this new crusade; would he were here with us to-day to accept my formal adherence to his cause.

There is, I believe, for a large number of the incurable insane, a better lot in store than to drag on their weary days in asylum confinement:—

> The staring eye glazed o'er with sapless days,
> The slow mechanic pacings to and fro,
> The set grey life and apathetic end.

In my evidence before Mr. Dillwyn's Select Committee in 1877 I was examined at some length on this question, and I stated that, but for my experience as Lord Chancellor's Visitor, and if I had not personally watched their cases, I could never have believed that patients who were such confirmed lunatics could be treated in private

* Macmillan & Co. London, 1880. Second edition.

families in the way that Chancery lunatics are. I also said that one-third of the Chancery patients were already so treated out of asylums, and I added that I was of opinion that one-third of the present inmates of the private asylums might be placed in family treatment with safety. In support of this opinion I put in this table:—

TABLE V.—*Showing the Proportion per cent. in Asylums and in Private Dwellings of the Chancery Lunatics and of the Private Patients (Lunatics not Paupers) under the Commissioners in Lunacy in England and Wales and in Scotland.*

—	Proportion per Cent.	
	In Lunatic Asylums	Under Home Treatment in Private Dwellings
Chancery Lunatics	65·4	34·6
English Private Lunatics.	94·1	5·9
Scotch Private Lunatics	93·8	6·1

This table deserves your attention. If 34·6 per cent. of the Chancery lunatics are successfully treated in private dwellings, while only 65·4 per cent. are in asylums, it is evident that of the private patients under the Lunacy Commissioners, of whom 94 per cent. are in asylums, some 30 per cent. are there needlessly, and hence wrongly, confined. I see instances of such cases every visit I pay to the private asylums.

Another convert to his cause, made by Baron Mundy, is one of the distinguished vice-presidents of this Section, Dr. Henry Maudsley, who, in 1867, in the first edition of his work on the "Physiology and Pathology of the Mind," strenuously condemns the indiscriminate sequestration of the insane in asylums, observing:—"The principle which guides the present practice is, that an insane person, by the simple warrant of his insanity, should be shut up in an asylum, the exceptions being made of particular cases. This I hold to be an erroneous principle. The true principle to guide our practice should be this: that no one, sane or insane, should ever be entirely deprived of his liberty, unless for his own protection, or for the protection of society."

Dr. Maudsley (to strengthen his argument) pointed to the condition of the numerous Chancery patients in England who are living in private houses. "I have," he writes, "the best authority for saying that their condition is eminently satisfactory, and such as it is impossible it could be in the best asylum," and he concluded an elaborate defence of this method of cure with this remark:—"I cannot but think that future progress in the improvement of the treatment of the insane lies in the direction of lessening the sequestration, and increasing the liberty of them. Many chronic insane, incurable and harmless, will be allowed to spend the remaining days of their sorrowful pilgrimage in private families, having the comforts of family life, and the priceless blessing of the utmost freedom that is compatible with their proper care."

In his recent essay on "The Cure of the Insane," Dr. Bucknill has a chapter entitled Household Harmony:—

> After many moody thoughts,
> At last, by notes of household harmony,
> They quite forgot their loss of liberty.

I give you therefrom his final and weighty conclusions in his own words:—"It is not merely the happy change which takes place in confirmed lunatics when they are judiciously

removed from the dreary detention of the asylum into domestic life; it is the efficiency of the domestic treatment of lunacy during the whole course of the disease which constitutes its greatest value, and of this the author's fullest and latest experience has convinced him that the curative influences of asylums have been vastly overrated, and that those of isolated treatment in domestic care have been greatly undervalued."

What I have hitherto said under this section applies to the home treatment of private patients. The treatment of pauper lunatics in private dwellings is another part of this question, and in which important financial results are involved. The system takes its origin from Gheel, and has been adopted in Scotland with great success. No less than 14·7 per cent. of the insane poor in Scotland are placed in private dwellings, under the official inspection of the Lunacy Board. Dr. Arthur Mitchell's evidence before Mr. Dillwyn's Select Committee and the several annual reports of the Scotch Commissioners give details of this method of treatment, which my limits only allow me now to refer you to. Financially the cost of this treatment does not reach 1*s.* a day; in the county asylums (including the cost of the fabric) it is not less than 2*s.*, a difference of 100 per cent. in expenditure.

With regard to England, 6,000 pauper lunatics, or 8·5 per cent. of their number, are registered as living with their relatives, or boarded in private dwellings, under the authority of the boards of guardians, whose medical officers visit the patients every quarter, and make returns to the Visitors of the county asylums, to the Lunacy Commissioners, and to the Local Government Board. None of these authorities, however, take much notice of the returns, and little or nothing is known of the condition, care, or treatment of these 6,000 pauper lunatics. Any further amendment of the Lunacy Law should certainly, in some way, bring them within the cognisance and inspection of the Lunacy Commissioners, as is done in Scotland.

A successful effort further to extend this system in England is related by Dr. S. W. D. Williams, the Medical Superintendent of the Sussex County Asylum, Hayward's Heath, in his evidence before Mr. Dillwyn's Select Committee, and also in a paper, "Our Overcrowded Lunatic Asylums," published by him in the *Journal of Mental Science* for January, 1872. My limits compel me to be satisfied with this brief reference to the important questions included in this third section of my address, "The Insane in Private Dwellings."

IV. The English Lunacy Act.

Lastly, I would say a few words on the Lunacy Law of England, which, setting aside the special statutes, dating from King Edward II., regulating the proceedings in Chancery, are the result of the legislation of 1845, and consist chiefly of Acts amending other Acts. They form a large volume, which has been carefully edited by Mr Fry.* A Bill for the general consolidation and amendment of these several statutes is an urgent need. The Government of Lord Beaconsfield announced, in Her Majesty's speech from the throne on the opening of Parliament in February, 1880, that such a measure was in preparation; and although the political necessities of the Irish question have this year unfortunately absorbed all the energies and time of the Government, we have assurance, in the extreme solicitude which the Lord Chancellor on all occasions so markedly shows for the welfare of the insane, that the Government will be prepared to give the question of Lunacy Law Reform their early and careful attention. I am disposed to think that, previous to such

* "The Lunacy Acts: containing the Statutes relating to Private Lunatics, Pauper Lunatics, Criminal Lunatics, Commissioners of Lunacy, Public and Private Asylums, and the Commissioners in Lunacy; with an Introductory Commentary," &c. By Danby P. Fry, of Lincoln's Inn, Barrister-at-law. Second edition, London, 1877.

legislation, a Royal Commission should be issued to investigate and report on the working in detail of the Lunacy Law, and to make suggestions for its consolidation and amendment.

It is exactly twenty-one years since a Parliamentary Committee reported to the House "On the Operation of the Acts of Parliament and Regulations for the Cure and Treatment of Lunatics and their Property." Many changes have passed over this department of medicine since the date of that report, and the temporary amendments of the Lunacy Law of 1845, which resulted therefrom, have almost served their purpose. The chief of these enactments, the Lunacy Acts Amendment Act, 1862, passed the following year, and embodied the various suggestions of the Lunacy Commissioners, based on their experience of the working of the Act of 1845, and from an official point of view was a valuable contribution to the Lunacy Law, but it failed to give effect to many of the recommendations of the Select Committee of 1860. In the same year passed the Lunacy Regulation Act, 1862, which led to considerable amendment of the proceedings in Chancery. The important requisite, however, of a cheap and speedy method of placing the property of lunatics under the guardianship of the Lord Chancellor has yet to be attained. One of the most experienced officials in Chancery, Master Barlow, in his evidence before Mr. Dillwyn's Committee in 1877, said :—"I am a great advocate for a great reform in Lunacy (Chancery) proceedings; I would facilitate the business of the procedure in the office, and shorten it in such a way as to reduce the costs."

After the evidence given by Dr. Arthur Mitchell before Mr. Dillwyn's Select Committee of 1877, it is evident that in the consolidation and amendment of the English Lunacy Laws the Scottish Lunacy Law and practice must be carefully considered. It is in Scotland alone that the whole lunacy of the kingdom is under the control and cognisance of the Lunacy Board.*

Again, the relation of the Lunacy Commissioners to the county asylums under the County Financial Boards (whose advent is nigh at hand) is a difficult question, the final solution of which will influence for good or evil the future of these asylums. Herein also falls the question I have before referred to, of the annual Parliamentary grant for pauper lunatics maintained in asylums, and reaching now to half a million a year. Is the Central Government to check, through the distribution of this grant, the county boards; or are they to retain the same authority over the county asylums as is now exercised by the justices in quarter sessions? The whole future efficiency of the English county asylums depends upon the right adjustment of the relative control given to the local authorities through the new county boards, and to the Central Government through the Commissioners in Lunacy.

There is also for consideration, as in contrast with the Lunacy Laws of Scotland, the divided jurisdiction of the Local Government Board and the Commissioners in Lunacy over pauper lunatics in workhouses, of whom 17,000, or 26 per cent of their number, are there and in the metropolitan district asylums under the control of the Local Government Board with the merest shadow of inspection by the Lunacy Commissioners. Again, to what extent is the credit of the ratepayers to be used in the establishment of public asylums for private patients? I have already said how much I desire to see the public asylum system, as now existing in the registered lunatic hospitals, extended, more particularly in the Home Counties, by this method. Then the wide question

* I may be pardoned, if I venture here to refer to the annual reports of the Commissioners in Lunacy for Scotland, as containing an amount of well-digested statistical information regarding the lunacy of the kingdom which we search for in vain elsewhere.

of official asylum inspection. Is the present amount of it enough, and the method of it sufficient for the needs and protection of the insane, or does the Lunacy Commission require both extension and remodelling?

These are but a few examples of the difficulties besetting the question before us of the consolidation and amendment of the English Lunacy Law, and which leads me to the opinion that the whole subject, now ripe for solution, requires skilful and scientific sifting by a Royal Commission, previous to any consolidating and amending Act being laid before Parliament. I am glad to have this occasion to express my personal confidence in the ability, industry and integrity with which the existing Lunacy Law is administered by the Commissioners. If I were disposed to criticise their policy, I might say that they trust too much to their one remedial agent, the extension of the county asylums, for meeting all the requirements and exigencies of the insane poor, while as regards the private asylums, with 54 per cent. of the private asylum population under their sole control in the metropolitan district, that they have from the first, since 1845, been content to enforce the remedying of immediate shortcomings, rather than endeavoured to place before the proprietors any standard of excellence to which they shall attain.

In concluding my remarks on the last section of my subject—the Lunacy Law of England—I would say that no mere amending Act like that of 1862, embodying simply the further suggestions of the Lunacy Commissioners, will satisfy the requirements of the medical profession or of the public. In the evidence taken before Mr. Dillwyn's Select Committee in 1877 will be found many suggestions for the further amendment of the Lunacy Law of an important character, one or two of which Mr. Dillwyn embodied in his Lunacy Law Amendment Bill of this year, which, as I have already said, has been withdrawn. It is impossible for any private member of Parliament, actuated though he be by an earnest desire to remedy grave evils, to deal with so wide and complicated a question as the consolidation and amendment of the English Lunacy Law. No one is more fully aware of this impossibility than is Mr. Dillwyn, and no member of the House is prepared more heartily to support the Government in passing a wide and comprehensive measure of Lunacy Law Reform.

I fear, gentlemen, that I have exceeded the limits of an opening address. Yet the wide subject which I selected—Lunacy in England (*Englands Irren-Wesen*)—did not admit of shorter treatment or of further compression. It is, after all, but a bare outline that I have to-day been able to sketch, of the present condition of the insane in England, and the manner and method of their care and treatment. I may claim to have endeavoured to give you a truthful picture of our present state, and I certainly have not desired to hide our many shortcomings from you. Indeed, my object in selecting this subject for my address is the hope that the position I fill to-day in this great International Medical Congress, may gain for my ideas on lunacy reform, which I have thus brought before this Section, a practical recognition such as I could not, under other circumstances, expect my humble opinions to command. If such a result should follow, I truly believe that the use I have made of this great opportunity may be the means of extending to the insane of all classes in England that further measure of protection and liberty which the experience of the past working in the county asylums of the Lunacy Act of 1845, on the lines of the non-restraint system, has now shown to be alike practicable and safe.

Sur la Mégalomanie.

Dr. Achille Foville, Paris.

Je m'acquitte d'un devoir agréable en rappelant que la première description du délire orgueilleux est due à un médecin anglais, Arnold, en 1728. Mais elle paraît avoir peu frappé l'attention jusqu'à l'époque de la découverte de la paralysie générale de 1820 à 1825. Bayle alors regarda le délire des grandeurs comme un caractère nécessaire et suffisant de la paralysie générale; mais cette opinion fut combattue par Georget et Calmeil, et n'a jamais été complètement admise. Tous s'accordent à déclarer, qu'il y a des cas nombreux de paralysie générale sans délire ambitieux, et, d'autre part, que ce délire existe dans des cas de folie étrangers à la paralysie générale. C'est sur un point limité de cette question que je reviens aujourd'hui.

On constate très-facilement que les cas de folie ambitieuse constituent deux groupes; l'un appartenant à la paralysie générale, l'autre à ce que l'on appelait autrefois les monomanies. La distinction est ordinairement assez facile; dans la paralysie générale, le délire ambitieux est diffus, mobile, incohérent, généralisé, absurde; tandis que dans le délire partiel, il est fixe, systématisé d'une manière logique et progressive. C'est surtout à cette dernière espèce que M. Dagonet a donné le nom de Mégalomanie.

Ici, l'on pourrait, au premier abord, croire que ces aliénés doivent se sentir très-heureux et jouir de leurs avantages imaginaires. Rien ne serait moins conforme à l'observation qui montre que les idées ambitieuses sont constamment associées à des idées mélancholiques. Si l'on interroge avec assez de patience les mégalomanes, on manquera bien rarement de constater chez eux, à côté de leurs idées d'ambition et d'orgueil, un véritable délire de persécutions, accompagné d'hallucinations de l'ouie.

Voici le travail mental dont cette coexistence résulte le plus souvent. Pour certains hallucinés persécutés ce n'est pas assez de s'être convaincus qu'ils sont traqués par des ennemis acharnés, ils veulent pénétrer la cause de cette persécution. Quel motif peuvent avoir des personnes puissantes de s'acharner sur eux, gens inconnus, d'une situation modeste? Ils finissent enfin par entrevoir une solution à cet étrange problème; ils ne sont pas des personnages si peu importants, et l'on tient ainsi à les tenir dans l'obscurité ou de faire ignorer leur véritable origine. Ils appartiennent donc à une famille princière, royale, et sont les victimes d'une conspiration infâme, d'une substitution criminelle.

Dans toutes les histoires de mégalomanes qu'il m'a été donné d'étudier en détail à une époque assez éloignée du début pour que la maladie fût arrivée à sa période d'état, j'ai trouvé la même combinaison d'hallucinations chroniques, d'idées de persécution et de délire ambitieux systématisé. Il faut, je crois, considérer comme une cause prédisposante morale, le fait d'être enfant naturel; ainsi, sur les douze observations relatées dans mon premier travail, cinq appartenaient à des enfants naturels.

Si je me permets de produire de nouveau, après un délai de douze ans, devant le Congrès International de Londres, cette théorie de la Mégalomanie, c'est que je la considère maintenant définitivement demontrée, et devant entrer dans la science médico-psychologique.

DISCUSSION.

Dr. Maudsley, London: laid particular stress upon the frequency of this form of insanity in natural children, of which he remembered to have himself seen an example;

and Dr. SAVAGE, London: referred to its frequency (in his experience) among governesses and others whose position in life was not in accordance with their cultivation and accomplishments.

Physiologie Pathologique des Hallucinations.

Dr. EDOUARD FOURNIÉ, Paris.

Après avoir dit que l'hallucination se distingue de l'illusion pathologique en ce que la première n'a pas besoin pour se produire de l'occasion d'une cause impressionnante extérieure, intérieure, ou psychique, et qu'elle est immédiatement le produit du cerveau malade, M. Fournié ajoute que l'hallucination est un phénomène de mémoire morbide.

Partant de là, il établit les conditions anatomiques et physiologiques de la mémoire. Les premières sont les couches optiques, les cellules de la périphérie corticale du cerveau et les fibres unissantes du noyau blanc de l'encéphale. Les couches optiques transforment les causes impressionnantes en choses senties, soit que l'excitation provienne de la périphérie par les nerfs sensitifs, soit qu'elle provienne de la couche corticale du cerveau; les cellules de la couche corticale, après avoir reçu l'ébranlement qui correspond à une impression perçue dans les couches optiques, gardent en puissance ce mode de vivre et quand plus tard celui-ci vient à se produire, spontanément, ou sous l'influence d'une excitation de voisinage, l'excitation se transmet à travers les fibres du noyau blanc jusqu'à la cellule correspondante des couches optiques. Le réveil de celles-ci sous l'influence d'une excitation provenant de la couche corticale donne naissance à une sensation de souvenir.

Cette sensation n'est qu'une partie de la mémoire. Pour se souvenir tout-à-fait, il faut avoir le sentiment de son activité passée; et ce sentiment consiste, pour l'intelligence, à se reconnaître dans ses propres actes. Elle seule a le pouvoir de connaître, et du moment qu'elle connaît, elle a conscience du travail qu'elle a effectué pour acquérir la connaissance. La sensation de souvenir et le sentiment de l'activité passée telles sont les conditions fondamentales de la mémoire.

La mémoire est toujours identique à elle-même, mais les conditions de son développement varient selon la nature des sensations de souvenir.

M. Fournié divise par ce motif les mémoires ainsi qu'il suit:

1.—Mémoire des sensations de la vie fonctionnelle de nutrition.

2.—Mémoire des sensations de la vie fonctionnelle de reproduction.

3.—Mémoire des sensations des organes des sens.

4.—Mémoire des sensations qui résultent de l'activité volontaire de nos organes.

Après avoir signalé les particularités que présentent ces divers groupes, M. Fournié s'applique surtout à faire connaître le dernier qui est le plus important, car il renferme la mémoire du langage. C'est à l'aide de cette mémoire que l'homme pense, imagine, et raisonne, c'est elle par conséquent qui constitue les hallucinations de la pensée, de l'imagination et de la raison.

Passant à l'application de la physiologie à la pathologie, M. Fournié définit l'hallucination: Un acte de mémoire involontaire et inconscient, dans lequel la représentation subjective est exagérée au point de donner à l'halluciné le sentiment d'une représentation objective.

Cette définition repose: 1. Sur ce que l'hallucination s'impose au malade comme un fait à la participation duquel sa volonté et sa conscience restent complètement étrangères. 2. Sur ce que dans l'hallucination la représentation subjective dépasse les limites

normales à ce point que les sons, les images de souvenir, deviennent pour l'halluciné une réalité objective.

Le mécanisme de l'hallucination est absolument le même que celui de la mémoire physiologique: L'halluciné trouve dans les cellules de la périphérie corticale du cerveau les conditions du souvenir de tout ce qui l'a impressionné. Ces cellules venant à entrer en activité d'une manière maladive, elles réveillent dans les couches optiques l'apparition de l'impression qu'elles représentent, et ce réveil s'étendant jusqu'aux nerfs de la périphérie, donne à l'halluciné le sentiment d'une cause impressionnante réelle.

Après avoir caractérisé, défini et montré le mécanisme de l'hallucination, M. Fournié a adopté le classement suivant:

1.—Hallucinations des sensations de la vie fonctionnelle de nutrition.

2.—Hallucinations des sensations de la vie fonctionnelle de reproduction.

3.—Hallucinations des sensations des organes des sens.

4.—Hallucinations des sensations qui résultent de l'activité volontaire de nos organes.

Cette classification, il est aisé de le voir, repose sur les données physiologiques et a permis à l'auteur de montrer sous leur véritable jour des hallucinations dont le caractère était mal déterminé jusqu'ici. C'est ainsi qu'il a exactement défini ce qu'on appelle hallucinations psychiques, en disant qu'elles ne sont autre chose que l'hallucination de la fonction-langage; c'est ainsi encore qu'il a montré le tort que l'on a de classer les paroles entendues par l'halluciné parmi les hallucinations sensorielles. Ces paroles constituent l'hallucination de la fonction-langage.

DISCUSSION.

In the discussion that followed, Dr. Fournié's views were generally dissented from, their hypothetical nature being particularly insisted on by Dr. Ashe, Dublin: and the fundamental difference between hallucination and memory urged by Professor Lasègue, Paris.—Professor De Jong, Amsterdam: pointed out that there need be no activity of the peripheral organs of sense in hallucinations: he believed these to be due rather to stimulation of the sensory centres in the cortex cerebri, which transmit their impressions to the optic thalami.

Dr. Savage then exhibited some Brain Sections made by Dr. Holler, and explained the method employed. In Dr. Holler's absence his paper was taken as read; but the following is an abstract:—

Präparationsmethode zur Anlegung grosser Durchschnitts-präparate des menschlichen Gehirns.

Dr. Anton Holler, Vienna.

Allgemeines über die Methode; ihre Unterschiede und Vorzüge gegenüber andern

Härtung des Gehirns in doppeltchromsaurem Kali oder in Müller'scher Flüssigkeit ohne Alcohol.

Anlegung von grossen Hirndurchschnitten, nöthige Instrumente und Vorrichtungen.

Färbung dieser Schnitte in carminsaurem Ammoniak.

Einlegen derselben in Canadabalsam.

Präparation der auf dem Objectträger fixirten Schnittpräparate zur mikroskopischen

Untersuchung: anfangs kann mit gröberen Messern geschnitten werden, später wird mit feinen, tenotomförmigen Messerchen *geschabt*.

Einschliessen der Präparate nach Aufhellung mit Nelkenöl, &c.

Schwierigkeiten dieser Methode.

Beschreibung der ausgestellten und auf diese Art angefertigten Präparate.

DISCUSSION.

This was particularly discussed by Professor BENEDIKT, Vienna: who pointed out that this method was much easier than the use of Gudden's microtome, and might therefore be employed with advantage by beginners, but was less accurate, owing to the displacement (particularly of pathological changes) which must inevitably be caused.—Dr. DE JONG, Amsterdam: considered Holler's method most suitable for macroscopic sections, where alcohol is not injurious; but for microscopic purposes gave the preference to Gudden's sections.

Certain Morbid Appearances produced by Methods of Hardening Nervous Tissues.

Dr. SAVAGE, London.

Dr. SAVAGE read a paper on "Certain Morbid Appearances produced by Methods of Hardening Nervous Tissues," of which the following is an abstract:—

Various pathologists have from time to time shown that changes which seem to be due to disease are owing to the preservative agents used; but the subject has attracted too little attention, considering its importance. About eight years ago I was much struck with the fact that I always found certain bodies in all brains and spinal cords sent to me from a distance for examination. By examining healthy human brains, and also those of rats, squirrels, monkeys and parrots, I found bodies which were not due to disease, but to the mode of preservation. They occur particularly in nervous tissue which has been kept long in spirit before being placed in the chromates; the time required for their formation varies. My opinion is that these bodies are due to some decomposition which goes on in the spirit, and not to be distinguished from miliary degeneration. There are several kinds of bodies found; but none of them seem to be soluble in ether, alcohol, or chloroform, or to present the reaction of amyloid matter.

Dr. Savage exhibited some specimens, obtained from healthy brains, human and of the lower animals.

DISCUSSION.

Dr. BENEDIKT, Vienna: endorsed the importance of the subject, and fully agreed with the author that the appearances are due to some kind of decomposition, but believed that they occurred more readily in diseased tissue than in healthy.

The Teaching of Psychiatric Medicine.

Dr. T. S. CLOUSTON, Edinburgh.

I propose in this paper to say very little about the advantages to medical men of some knowledge of mental disease, or of the necessity which I believe exists that psychiatric medicine should be taught in our Medical Schools. If the arguments, that already there are 500 members of our profession who have to treat the insane in

Asylums, that the law throws most responsible medico-legal duties on most members of our profession in relation to insanity, that the home treatment of the disease in its early stages falls in ordinary course on the general practitioner, and that one in every 300 of our population is insane and needs treatment of some sort, if those arguments are not sufficient to show that our medical students should be taught something of insanity before they begin to practise medicine, then assuredly the pleadings of a teacher of psychiatric medicine will not avail much. It is surprising, however, how unanimous is the opinion that all medical men ought to know something about mental diseases, and that all students ought to be taught something of them. It is a general principle on which doctors do not differ, and lawyers are in complete accord, while those of the general public, who are in the way of having insane people about them requiring treatment, assert the principle very strongly indeed.

Two excuses are commonly assigned why the knowledge has been imperfect, and the teaching not attended to. The one is that there had been no convenient opportunity of the student studying the disease, and the other the already "Overloaded Curriculum." A third argument was brought forward last year by the President of the Psychological section of the British Medical Association, at Cambridge—viz., that "the teachings of psychological medicine are still so ambiguous and unsystematic, that they can scarcely pretend to supply either much useful instruction, or a valuable discipline to the mind," and he accordingly strongly discourages students from having anything to do with it. The "no chance," "no time," "no good," excuses will have to be met, not by argument and talk, but by a practical demonstration, that many students have actually taken the time, that they have opportunities, and that they have got some good from the instruction received, If Dr. Browne's present opinion that psychological teaching does not pretend to supply much useful information, is to be taken seriously, it would be very discouraging to the present teachers of the subject, as coming from one who himself taught it for many years, extolled it highly, and two or three years ago, after having said that his professional brethren "generally" know very little about lunacy, told a Select Committee of the House of Commons, that "it would be a great improvement if it were made compulsory upon medical men to obtain some training in lunacy during their medical education, if a course of instruction in mental disease was a part of a medical education." Of course circumstances alter cases, and it would be hard on any of us, if we were tied down to express the same opinions always. Dr. Browne told his Cambridge audience that, this psychological food which was so useless to the student, was very good indeed for them when properly administered through the British Medical Association, and it was a right and proper thing for them to take their fill of it.

My present remarks will be addressed to the following questions:—

(1) What is the best mode of teaching psychiatric medicine to the student?

(2) Can the student with four or five years of study at his disposal, devote as much time as is requisite to be taught as much about mental diseases, as will be really useful to him in practice?

(3) If the subject is not to be one of those on which a student's knowledge is to be tested, even to a minimum extent, when passing his examination for his ordinary license, should it not at least be one of the subjects of examination for honours in the medical degrees, for all the higher qualifications such as the M.D. when the M.B., has been taken already, Memberships and Fellowships of Colleges, &c., and should it not be required for such public appointments as those in Public Health, to Gaols, under the Local Government Board, and in the Indian, Army, and Navy Services?

The first question, "What is the best mode of teaching Psychiatric Medicine to the Student?" can only be answered satisfactorily by an appeal to experience. I am well aware too that in referring to my own experience I am appealing to a limited range of facts. Another man's experience may be totally different from mine. Other men may teach far more successfully in other ways than those I am about to describe.

My own experience as a pupil was derived from my predecessor at Morningside, Dr. Skae, who taught insanity in the Medical School at Edinburgh. His method was to deliver a set course of two lectures a week during the summer session, and have his students out once a week to the asylum. They were taken round the wards by himself or one of his assistants, and the cases talked about as they were met with. No systematic attempt was made to collect together cases of the same disease the same day, and the histories of the cases were not read from the case books, or minutely gone into. Dr. Skae had classes of over thirty students, and charged a fee of three guineas for his course. The subject was required for the Army Medical Service at the time. In common with very many of Dr. Skae's old students, my experience is that very much and most useful and practical knowledge of insanity was derived from his course. We were made to recognize its chief types, it passed definitely into our consciousness and experience as a disease to be studied and treated like any other disease, and we were all intensely interested in the whole course.

Dr. Laycock for twenty years taught and professed to teach, not psychiatric medicine in its restricted and practical sense, but medical psychology in its large sense, as understood by Feuchtersleben. Indeed Dr. Laycock's conception of his subject was best understood by the title of his book, "Mind and Brain." He delivered four systematic lectures a week during the summer session in the university, with a clinical demonstration in an asylum about once a week, with practice in signing certificates of lunacy. Dr. Laycock's course was most suggestive, original, and instructive. His class sometimes amounted to forty students; his fee being latterly four guineas for the course.

I have now had eight years' experience as a teacher of mental diseases in Edinburgh. I have tried various methods of instruction, and have tested their results by general observation, as well as by severe class competitions, and I shall describe the method I at present adopt, which, I think, has yielded the best results so far. My course is a summer course of three months, and by far the majority of the students are in their fourth year. I must say also that as a general rule the students who attend my class are rather above the average in ability and application, and I always have a few men who are all round the the best of their year. I give twelve systematic lectures in the University, one a week; the students come out to the asylum twice a week for clinical instruction, and towards the end of the course I give four systematic demonstrations from specimens and diagrams, two being macroscopic, and two microscopic, on the pathology of insanity. I always begin the course by a lecture on the general functions and structure of the brain, as far as they relate to its mental functions or to mental disease. I shall not say anything regarding the systematic lectures, for every teacher will take his own classifications, divisions, and methods. But one thing I have been strongly impressed with in the delivery of those lectures to the students: the more one sticks to the concrete facts of Nature, the better one is attended to. The narration of an illustrative case will rouse the attention of every student in the sultriest day, when it was flagging in the effort to listen to general descriptions. And another thing I have been impressed with: the interest of the students always seemed to heighten if the condition of mental disease being described could be traced to physiological psychical states—*e.g.*, if the morbid exaltation of simple mania can be clearly connected and related in its symptoms and evolution with the physiological exaltation of a sanguine temperament and a nervous diathesis, or with the normal exaltation seen in a sane brain from extraordinary stimuli and causes of joy, or with the normal psychical exaltation of a young child. I devote one lecture towards the end of the course to the medico-legal and medico-social duties of our profession, and the last to general facts about the numbers of the insane, the curability and mortality of the insane, the prevalence of the different forms of insanity at different ages and places, &c. I supply a printed syllabus of each systematic lecture to each student as he enters the class-room.

It is regarding the clinical teaching of insanity that I wish specially to speak. All my experience has been that this is the backbone of the teaching. For real use to the student, for interest to him at the time, for the permanent impressions left on his mind, we must look to this. Here he gets the facts of Nature at first-hand seen by himself. Here he is brought as a physician face to face with a new disease affecting the supreme part of man, and it never fails to interest him. Here he gets the first real glimpse and realization of these great medico-psychological and medico-social questions relating to the connection of mind and morals with organization and brain. If any teacher could impart to the student clinical instruction in a case of mental disease commensurate with its real interest, every student would flock to his class. I never feel myself so helpless as when I have before me an interesting case of mental disease and a class of students to whom I have to explain its features and import. It is then that our present imperfect knowledge of the mental functions of the brain is most fully realized. The problems of heredity, causation, subtile inception, and co-relation with the nutrition and dynamics of brain cells are so pressing and yet so undefined scientifically in such circumstances, that he would be a very self-confident man who did not feel the load of his ignorance more oppressive than the sum of his knowledge. Student and teacher feel instinctively that here the facts are most important and most interesting, whether we can interpret them rightly or not. medico-psychological teaching may be valueless, but the medico-psychological facts to be seen in any actual case of mental disease must be of value to a physician who has to practise his profession. No rational man can doubt that every advanced student must be the better for having had an opportunity of seeing such facts in a patient, and few people can doubt that every student would be the better for seeing a well-assorted typical series of such cases before he is licensed to practise. Now how can a case of mental disease be best seen and studied, and its main features brought out to a class of students in what is ordinarily understood by a clinical lecture or demonstration? And how can a typical series of cases be best brought before them? Of one thing I am quite sure from my experience. Much system and order must be adopted in such a short course as mine. Going through asylum wards too much does not admit of this. The student's attention is distracted, and you do not find together cases that illustrate properly all the facts of one type of insanity. I devote the first three cliniques to the illustration of disorders and alterations of each of the great brain and mental functions seriatim. I take cases each one showing typically, impairments and changes in the following mental and brain functions—viz., the reasoning powers, the affective faculties, the inhibitory power, memory, the animal and organic appetites and instincts, the special sense functions, the sexual and generative functions, the power of rest in sleep, the motor, sensory, and trophic functions of the brain. The students sit in a room, and the cases are brought in singly while I try to direct and concentrate their attention on the one point to be illustrated by each case. My object is to create in each student's mind a vivid sense of the direct connection of brain derangement with abrogation and alteration of each of what he has been taught to regard as a faculty of the mind, in insanity. Nothing so enables a student to realize that maternal affection is a brain quality, as to see a puerperal case where the woman has forgotten her sucking child, or has had her affection for it so completely perverted, that she has tried to murder it. No amount of talking will make such an impression on him, that the instinct of the love of life is directly connected with soundness of brain function as to see a case of suicidal melancholia where the patient desires to die with as great intensity as any man ever wished to live. This I look on as introductory to the real clinical course. I don't go into the history of those cases or into any other features than those illustrating the point I wish to bring out.

In the next ten cliniques I endeavour to illustrate the chief symptomatological varieties of mental disease by taking two or three typical examples of each, first reading the history of each case to the class, then having the patient in, and bringing

out the features as best I can, and then making some remarks as to prognosis, &c., after the patient has left the room. Some varieties of insanity admit of a full commentary in the presence of the patient. In most cases, however, this cannot be done. I don't find the patients often object to being made the subjects of a lecture. In many cases they are proud of it. I have never known it do a patient any harm. It is unquestionably difficult in very many cases to bring out the mental symptoms clearly and in a reasonable time before a class of students, but in one's endeavour to do this students have a valuable lesson as to how to speak to insane patients and treat them. In this way I go over the great conditions of morbid mental depression, exaltation, delusion, enfeeblement, and loss of inhibition.

I then begin to tell off one or two students each day to see patients alone, to diagnose the disease present, and to sign a medical certificate of lunacy. These certificates are each day read aloud and commented on before the end of the clinique. In that way I get plenty of opportunities of saying all I have to say as to this important matter. Each student has in turn to sign a certificate, and have it criticised.

By this time the students know as much about the disease as to make an occasional visit to the wards profitable, especially to the admission and sick wards. They now look on the patients, not from the point of view of mere curiosity and amusement at their peculiarities, but as examples of disease, from the physician's point of view. The bulk of the real and exact clinical teaching, I believe, is done by the study of individual cases brought in before the students.

The remainder of the session is taken up with the illustration of the clinical varieties of insanity, the epileptic, puerperal, climacteric, senile, &c., forms. When any interesting case is admitted, it is often the subject of a special clinique, such as cases illustrating the suicidal or homicidal tendencies, the complications of insanity with hysteria, aphasia, or special motor, sensory, or trophic symptoms. One clinique is devoted to idiocy and congenital imbecility. All the post-mortem examinations that occur during the session are done after the cliniques.

My experience goes to show beyond all doubt that most students are much interested in cases of mental disease. With the immense disadvantage of the asylum being a mile and a half from the university, and their having therefore to spend two hours to each clinique, they come out with most commendable regularity, and they take up the points of the cases with keen intelligence. It is a real pleasure to have a few good cases to bring out before them. They look on it as a new field with certain features quite new to them.

I ought to have mentioned that on the Saturdays during the months of March and April, I give preliminary informal cliniques for the benefit of those who propose to take out the class in May, so that it may not be quite a *terra incognita* to them, when the summer session begins.

2.—The next question is this—"Can the student with four years of study at his disposal devote as much time as is requisite to be taught enough about mental diseases to be really useful to him in practice?"

This is the real point at issue between those who do not think that the student should be examined as to his knowledge of mental diseases, and those who do. I have most carefully inquired into this matter, seeing how the time and attention required seemed to affect their other studies and preparations for the examinations, and talking with many students on the subject. Last year I had a class of forty-five. There were about 120 fourth or fifth year's students who went up for the examination for the M.B. degree, about ninety of whom passed, and to my knowledge only two of my class were among the plucked men. Now this of course may be read in different lights. It may be said that it was the best men, those who were well up, that took out such an optional class as mine. Here I may say that they have no pressure or inducement whatever to take out the class of mental diseases, except a desire to know something of the subject. No question is ever put on the subject for the degree, the

class is not needed for anything, the university authorities do not recommend them to take it out, I am not an examiner in any subject, they never see me till they come to the class, and they have to pay me a fee of three guineas for the course. No doubt the best men take out this as well as the other extra classes, but considering that they are passing their degree examinations during the summer they have out the class, and that it depends on how they answer the questions in the ordinary subjects whether they take honours or not, the fact that they should have devoted any time at all to such a subject shows that they do not think it withdraws their attention unduly from their examination subjects. As a matter of fact, the "Ettles Scholar" of the year at the graduation—that is, the man who has attained the most marks all through the various examinations—has taken out the class of mental diseases three years out of four both in Professor Laycock's time and in mine. Such facts prove conclusively that the best men can study mental diseases before taking their degree, without affecting injuriously their other and necessary studies. I must say they do not read up the subject from books. They all say they have no time for that. But at my class competition for the prize, as well as in my intercourse with the students, I have proofs that they acquire a most practical knowledge of the subject. In the former I give six questions over the whole of the subject, and after answering these each student gets a patient whose case he has to write out, giving the diagnosis, prognosis, and treatment, and then he signs a medical certificate of lunacy. I often have the answers, the cases, and the certificate about as well done as I could do myself. Can anyone doubt that a man with this special knowledge goes into practice better prepared for all emergencies that may arise, than the man who has never seen a case of mental disease?

But then comes the question as to the student who is under the average or just up to it? Can he afford to have any distraction of his mental energy at all, just when passing his final examinations? Should he be encouraged to undertake anything that may lessen his chances of passing, or withdraw his mind from what is essential? The opinion of many of the members of our Edinburgh Medical Faculty, I believe, is, that such students should not take out more classes than those in the curriculum except they study for five years. I have some such students in my class, and I never heard of one who was plucked in consequence, but I am willing to admit that for many such men such a course as I have described in their last summer session would be distracting, and might imperil their chances of attaining the degree. But when such men go into practice, they, like their fellows, will have to treat cases of insanity, to sign certificates of lunacy, and give evidence as to mental disease in the courts of law. And this without having seen a case of the disease previously, or been told anything about it. It is all very well to say they should read it up after passing. These are just the men who don't read much then but trade on the capital they have acquired in their medical course. Is there no way of meeting the difficulty? I think like all other difficulties it should be faced. I think a sort of minimum course of instruction could be instituted within the reach of every man who is fit to enter our profession at all. It should be intensely practical, and therefore purely clinical and short. I think much could be done in twelve clinical demonstrations, say on Saturdays during the last winter session. You must have patients to see to do any good. All students can be interested in the facts of nature and disease. I am often much impressed and amused in reading the answers to my questions at the class examinations. Men are apt not to stick to the descriptions I have given in my systematic lectures, but will rather take the features of the cases they have seen and describe them. We had an epileptic who tried to tear away another's testicles, one year. In that year's answers tearing away testicles was put down as characteristic of epileptic insanity by almost every student of the class! The twelve cliniques would therefore require to be given on most carefully selected cases with vivid and typical features. The whole thing would need to be most practical. Each student would require to sign a lunacy

certificate, and to be brought personally in contact, face to face, with a lunatic, to get the physician's mode of looking at him, instead of the sensational and popular mode which is natural to all men, who have not come practically in contact with the insane. Such a course to be well done would need far more thought and care than a complete course. Were it without care and slovenly, it would fail: well done, I believe, it would be of inestimable advantage to our profession, and to the insane. It is an insult to the intelligence of our medical students to say that such a compulsory course would interfere with their other studies. No mere lectures in a medical jurisprudence course could possibly take the place of seeing cases and hearing them commented on clinically by a competent teacher.

3.—The third question—viz., whether a knowledge of mental diseases should not be required for all higher degrees or qualifications, and for most of the public services and appointments—is one which few would care to deny *in toto*. The mental functions of the brain are the highest region of which our profession takes cognizance. Their derangement forms a difficult and important study. A complete knowledge of those derangements, their causes and prevention or cure, would necessarily be the very highest department of medicine. If it is not so regarded now, this is because our knowledge is as yet very imperfect, as compared with some other departments of the profession. Therefore increased study and attention are much needed by the best minds in our profession. All these reasons point strongly to the advantages of making the study one of those required for the higher qualifications in medicine.

The argument for some knowledge of mental diseases being neccessary for appointments in the public services is simply that men in these services have to do acts, which, to be done properly, require such a knowledge. It is unfair to the doctor and the patient to make a man determine the question of the sanity or insanity of a patient, the question of the abrogation of his personal liberty and his civil capacity, to lay on him the duty of signing medical certificates of insanity, when he has never had the opportunity of seeing a case of the disease, or receiving any instruction in regard to it. The very nature of his appointment gives him no choice as to doing these duties, and gives the patient no choice as to the man who shall decide for him these momentous questions. All the lunacy statutes clearly imply some knowledge of lunacy on the part of the medical men who carry them out. Is there such a knowledge? If not, then is our profession placing itself in a proper position with regard to those laws? Apart from the interests of individual patients, the interests of the State demand such a knowledge. There is looming up very near us a great question of State lunacy policy. Through the operation of previous Acts such numbers of persons, technically of unsound mind, have been sent by our profession to the asylums for the insane, that they are all nearly full, and every increase made to their accommodation is filled at once. The quiet imbecile, the harmlessly crazy, the restless paralytic, and the helpless dotard, occupy the wards intended for the curable and the actively insane. The public who has the bill to pay, is showing signs of restiveness and inquiry. No one can doubt that we shall soon need receptacles for the incurable apart from the asylums for the curable. That will imply the expression of an opinion, in some legal document, by a member of our profession, not only as to whether the case is of unsound mind, but whether it be curable or incurable.

Such are the considerations that, to me, seem very cogent in giving an affirmative reply to the question as to whether public medical officers, who have to do statutory duties in connection with lunacy, should be called on to prove that they know something about it before they undertake those duties.

DISCUSSION.

Dr. Hack Tuke, London: opened the discussion on Dr. Clouston's Paper. He contended that some knowledge of mental diseases should be required of every candidate for a degree, and he believed the difficulties alleged to be in the way of clinical instruction

would soon disappear.—Dr. MACDONALD, in New York, and Professor BALL, in Paris, have found no want of interest on the part of the students, who acquired a satisfactory knowledge of the subject; they have never seen the patients suffer from their examination before the students.

Dr. MAUDSLEY, London: considered that it is not at present possible to provide clinical instruction in London, with its scattered medical schools, and few asylums accessible; for this reason the subject has not been made compulsory by the University of London.

Mr. MOULD, Cheadle: on the other hand, has found no difficulty in getting students to come out nine miles from Owens' College, to his asylum, for instruction.

On Moral Derangement and Insanity in cases of Paralysis Agitans.

Professor BALL, Paris.

From the earliest dawn of medical science, the frequent occurrence of mental derangement, in convulsive diseases, has been considered as an ascertained fact. Epilepsy—both in its milder and in its more severe forms—chorea, and especially hysteria, have always been closely connected not only with a peculiar turn of mind, but also with certain definite forms of insanity. Of late, the limits of this peculiar province of morbid psychology, have been greatly enlarged; and other nervous affections, among which exophthalmic goitre stands prominent, have been joined to the list of the causes which produce insanity.

That painful and distressing malady, generally known under the various names of *shaking palsy, Parkinson's disease,* or *paralysis agitans,* although nearly similar in appearance to certain organic disorders of the nervous centres, whose symptoms closely resemble its own, still remains a member of that class of diseases in which no distinct and permanent lesions are found to account for symptoms observed during life; and, although my excellent and eminent friend, Dr. Luys, has, in some of these cases, discovered hypertrophy of the motor-cells in the medulla oblongata, it still remains to be proved that Parkinson's disease is constantly associated with this state of things.

Paralysis agitans may therefore be considered, in the present state of our knowledge, as a convulsive neurosis; and, as such, it seems natural to anticipate that, like epilepsy and chorea, it will sometimes be associated in some cases with certain peculiar forms of mental derangement.

In classical descriptions it is stated, in general terms, that, towards the latter end of the disease, the patient often falls into a state of despondency, which may, sometimes, amount to lypemania, and is occasionally attended with sensorial delusions, or with a marked diminution of intellectual power. But, as far as I have been able to ascertain, the record of cases positively amounting to insanity, in patients suffering from shaking palsy, is short and poor indeed.

In 1870, Dr. Althaus published a case of paralysis agitans, in which the patient, while under treatment by bromide of potassium, exhibited various symptoms of mental derangement—viz., agitation, delirium, and visual hallucinations. The question, of course, arises, how far the mental troubles were due to the treatment employed, and how far they might be attributed to the disease itself.

In the second volume of the "West Riding Lunatic Asylum Reports," Dr. Patrick Nicol inserts an elaborate Paper on the mental symptoms of ordinary disease, in which he draws attention to the mental and moral changes observed in two cases of Parkinson's disease. In the first, an extreme irritability of temper, which had not

previously existed, was the leading character; in the second, a general depression of the intellectual faculties was, in a psychological sense, the most important feature.

The late lamented Professor Lorain, in 1875, in a Paper on nervous diseases rising from strong moral emotions, mentions a case in which a sudden fright produced not only the motor troubles of shaking palsy, but also a general suppression of mental capacities, which fell barely short of complete fatuity.

Lastly, my friend and master, Professor Lasègue, records the interesting history of a lady who, after suffering for two years from partial dementia, became a victim of paralysis agitans. In this case, the usual process would seem to have been reversed, and the mental symptoms to have preceded the locomotor troubles, instead of following as usual in their train.

That other facts, which have not been brought to my knowledge, may point to the same conclusion, I have not the slightest doubt; but, from a rapid glance at the literature of the subject, it would seem that but little attention has been paid to this point. Struck with the leading features of Parkinson's disease, most observers have not inquired how the background of the picture was filled up; and, from existing data, it might naturally be inferred that psychological troubles in shaking palsy are a merely accidental occurrence.

Now, it so happens, that, within a limited space of time, a considerable number of such cases have been forced upon my attention. As, however, the mental symptoms were, in general, too moderate to bear analysis, I will select three of the more strongly marked cases, in which a sharp outline allows us to seize the more prominent points, which give this peculiar state of mind a distinct and characteristic appearance.

It may be said that the psychological symptoms in shaking palsy naturally arrange themselves under one of these headings.

In the first class of cases the symptoms are those of intense lypemania, amounting, in fact, to positive insanity. In the second, moral and intellectual depression, with loss of memory. and general weakness of mind, are the most prominent features.

In the third, the mental disease assumes an intermittent form.

Each instance which I have selected corresponds to one of the three classes which, I repeat it, are not artificial, but natural and necessary divisions.

Case I.—Paralysis agitans with intense lypemania, hallucinations of sight and hearing, mania of persecution, and suicidal impulsions.

Charles B——, an accountant, aged fifty-three, has been suffering, for the last five years, from shaking palsy.

The first symptoms of the disease were pains in the finger-joints of the left hand, and a slight tremulation in that part. The intensity of these morbid phenomena rapidly increased; and, after a space of eight or ten months, the whole of the left arm was affected with tremor. The progress of the disorder, from this time, was slow, but regular; and, eighteen months later, the lower limbs also were involved; in short, two years after the beginning of the disease, the patient was totally incapacitated from labour.

On the 11th of February, 1881, he was admitted into my service at the "Hôpital Laënnec."

The stiffness of his attitudes, the perfect immobility of his features, and the continual tremor affecting the upper and lower limbs on both sides, as well as the head, made the patient a perfect type of *paralysis agitans*. The man is able to walk, but with a strong tendency to run forwards. He enjoys the use of his hands, but both arms are semi-flexed at the elbow-joints, and the fingers are stiff: their attitude may be compared to that which they naturally assume in the act of writing, or in holding a pencil. The voice has a nasal twang: the patient speaks slowly, and with some difficulty, and the tongue is affected with a slight tremulous motion.

All these symptoms are manifestly increased by the slightest emotion; the mere fact of seeing the doctor approach his bed, and exchange a few words with him, sets the whole machine in motion.

The patient is, in fact, of a morbidly sensitive disposition; tears start to his eyes on the slightest provocation, and the general bent of his character is deep despondency.

But the most prominent and characteristic feature of his mental condition is a rooted belief that he is persecuted by imagining enemies, who, as he expresses it, are constantly "at him."

On examining the grounds of this obstinate delusion, we discover that, for the last five or six months, he has, every night, been tormented by visual and auditive hallucinations. Night after night he hears voices at a distance, which threaten, upbraid, and insult him. At the same time he sees and even feels his enemies: they stand round his bed, they approach him, they even touch him, and he struggles violently to save his life, which he believes to be in imminent danger.

The scene changes when the day breaks: his imaginary tormentors have disappeared, and he only remembers the terrifying visions of the night. During the earlier period of his delusions he was able to remember what the voices had said, and was able to repeat it the next morning; at present, however, his memory simply retraces the fact that such voices were distinctly to be heard; but he can no longer repeat their very words, as he formerly used to do.

Under the influence of his delusions, the patient has more than once evinced a strong tendency to commit suicide, but the most attentive supervision has, up to the present moment, kept him out of harm.

In other respects his judgment appears to be sound, and his conversation is rational: he exhibits, however, a considerable failure of memory, and never speaks of his own case without taking the most unfavourable view of the future.

I have considerably abridged the history of the case, omitting some important particulars, in order to draw attention to the psychological features of the case. A man, upwards of fifty, having never exhibited signs of mental derangement, and free from all hereditary taint, is affected, five years before entering our hospital wards, with shaking palsy; the progress of the malady reduces him to absolute impotence; and, without any other known cause, he falls a victim to nocturnal hallucinations, under their influences, becomes affected with the mania of persecution, the whole process culminating in a violent tendency to suicide.

We find here a strongly marked case of unmistakable *insanity*, in which the predominating neurosis seems exclusively responsible for the mental phenomena; neither the treatment adopted, nor the patient's personal or hereditary disposition, can, in any degree, be called to account.

It may be noticed, in connection with the auditive hallucinations, that, for some years past, the subject had been gradually growing deaf.

Our second case exhibits mental derangement of an entirely different type.

Case II.—D——, aged thirty-four, a hairdresser by trade, was born in Sardinia, and came to live in Paris in 1867.

During the war of 1870–71, he served in the French army, and took a part in the defence of Paris. Having considerably suffered from cold and damp, he attributes to these causes the disease from which he suffers now; yet the premonitory symptoms only made their appearance three years ago. He first began to feel a burning sensation in the lower limbs, whenever he stood up, or attempted to walk; after which it seemed as if cold water was trickling slowly down his legs; from time to time this painful sensation disappears, but only to return again, after a short interval.

About eight months ago the patient began to experience a slight tremulation in the left arm, which rapidly increased after the slightest exertion, so far as to compel him almost entirely to relinquish his employment as a hairdresser, in which, if we are to believe his own statement, he was singularly proficient.

Shortly afterwards, that is to say, about six months ago, the mental phenomena to which we desire to call attention, first made their appearance.

Like many of his countrymen, he formerly enjoyed great vivacity of spirits; his

temper was cheerful, his movements quick, his habits active. Gradually, however, he grew cold, lazy, and indifferent to everything around him; his heart was no longer in his work, nor did he take any pleasure in the amusements for which he formerly had a considerable relish; and, after having been an active, busy and intelligent man, he seemed to lapse into the condition of an idle, apathetic and half demented fool. His memory failed him; his movements became slow and clumsy, and, three months before entering our wards, he was literally fit for nothing.

From that time, the disease made continual progress; and, on the 18th of January of the present year, that being the date of his admission, he exhibited marked symptoms of paralysis agitans.

The face is pale, rigid, and without the slightest expression: not a muscle quivers in his countenance; he is able to walk and to use his hands, but moves with slowness and difficulty. The tremor is entirely limited to the left side; and, while hardly perceptible when the patient is at rest, it increases considerably when he attempts to move.

But the most striking feature in the patient's outward appearance, is a state of local asphyxia affecting both hands and feet; a bluish purple colour spreads over their surface, whenever the patient stands or walks, and their temperature grows icy cold. These singular phenomena partially disappear when the subject reclines in bed.

There exists great difficulty or, at least, great slowness in speech, without any tremulation or paralysis of the lips or tongue; at times, D—— seems almost to be affected with aphasia, and can scarcely find words to express himself; he enjoys, however, greater fluency of speech in his native language than in French.

The general impression which results from a first glance at the patient, is that of an impediment in all the functions of the brain. Motion and sensation, thought and speech appear to meet with some permanent obstruction; and, although the subject is not positively delirious, he stands in close proximity to a state of apathetic dementia. The absolute indifference which he exhibits to all things—the seemingly total absence of ideas, and the evident failure of memory—suggest the notion that sluggish circulation and local asphyxia exist in the brain as well as in the hands and feet.

The man left our ward on February 14, and has since returned to his native country.

While the above-mentioned case exhibits, in a marked degree, the depressive form of mental disturbance connected with Parkinson's disease, the third and last patient, whose history I will briefly record, is a type of intermittent, or transitory excitement.

Case III.—A lady in an advanced period of life was taken, ten years ago, with shaking palsy, limited at first to the right hand, then to both limbs on the right side; and extending, at a later stage of disease, to the left side of the body.

From the very outset the patient exhibited signs of evident mental derangement. Her conversation, which had never been conspicuous for wit or brilliancy, but which used to be sensible and rational, became, all at once, rambling and disconnected: she would talk and mutter to herself for hours together, and always evinced great irritability when interrupted or disturbed. But the even tenor of her ramblings was occasionally interrupted by fits of considerable excitement. On these occasions she would start from her bed, declare that she was going to leave the house, and threaten to commit suicide. After being quieted, with considerable difficulty, she would suddenly break forth again; and this state of perpetual excitement would last for two or three days together, after which she subsided into her usual state, and was comparatively calm.

The progress of the disease extended over three years; and the patient died in a state of insensibility, after an unusually long period of excitement. No post-mortem was allowed to take place.

From the preceding facts, I would beg to deduce the following conclusions:—

1.—That mental derangement is more frequent in cases of paralysis agitans than has generally been supposed;

2.—That, in its slighter forms, the psychological change is limited to irritability and restlessness ; but that, in the more severe cases, it amounts to positive insanity.

3.—That three forms, at least, of mental disturbance may be observed in such cases: the first corresponding to what is generally called lypemania, the second closely bordering on dementia, the third exhibiting an intermittent or periodical character.

Lastly, that there is in cases of shaking palsy no distinct connection between the loss of intellectual power, and the severity of physical symptoms.

DISCUSSION.

Dr. SAVAGE, London : remarked that intellectual disorders were connected with disease of the sensory rather than of the motor tract; and that the cases of paralysis agitans related might, therefore, be said to occupy an exceptional position.

Dr. C. MERCIER, London : thought that there was mental defect in every case of paralysis agitans, but that this, being usually negative, was overlooked, because of the greater prominence of the motor symptoms.

Dr. HUGGARD, London : related a case of insanity associated with paralysis agitans at present under his observation; the symptoms were those of *folie circulaire*, with exalted delusions during the excited periods.

Questions Médico-légales : de l'Explosion Soudaine d'accès d'Alcoolisme Aigu ou Subaigu par Choc Moral.

Dr. MOTET, Paris.

Les questions médico-légales relatives à l'aliénation mentale soulèvent les plus graves problèmes: j'ai l'honneur de vous soumettre l'une d'elles, qui, pour n'être pas des plus compliquées, n'en présente pas moins, dans la pratique, des difficultés de recherches assez grandes. Parlant devant des hommes qui sont l'honneur de la médecine mentale en Angleterre, je suis certain d'être approuvé par eux quand je dirai que plus le rôle du médecin qui tient dans ses mains la liberté, l'honneur, la vie quelquefois d'un citoyen, est considérable, plus grande aussi doit être sa préoccupation d'arriver à la vérité scientifique, et à la juste appréciation de la responsabilité de l'auteur d'un crime ou d'un délit.

Dans le monde, et dans le monde médical aussi souvent que chez les personnes étrangères à notre art, il semble que rien ne soit plus facile que de reconnaître si un homme est ou n'est pas un aliéné. Je ne vous apprendrai rien, Messieurs, en disant combien cette affirmation suppose parfois de recherches délicates ; dans un livre accueilli en France avec une faveur méritée, l'un des vôtres, M. le Professeur Maudsley a déterminé avec une grande netteté, avec une grande élévation d'idées, la mission et le devoir du médecin expert, et montré qu'à côté des cas évidents pour tout le monde, il y en avait d'autres d'une interprétation difficile, où la limite exacte entre la raison et la folie était presque impossible à fixer, et dans lesquels il fallait tenir compte des conditions défectueuses de l'organisation mentale de certains individus.

Le sujet que j'ai choisi est plus circonscrit. Je veux traiter devant vous une question de médecine légale que je prendrai surtout par son côté clinique.

Vous savez, Messieurs, que chez tout individu qui se livre aux excès alcooliques se développent des aptitudes à un délire spécial qui peut bien ne pas éclater tant que l'équilibre de la santé ne sera pas compromis, mais qui fera explosion aussitôt que la maladie surviendra. Un alcoolisé est pris d'une pneumonie, au cours de cette affection aiguë fébrile, il est pris d'un accès de delirium tremens, c'est là de l'observation journalière. Un autre fait une chute, reçoit une blessure grave, il est pris de la même manière après deux ou trois jours. Eh bien, Messieurs, sans qu'il soit possible d'établir une parité entre des maladies aiguës fébriles, un traumatisme physique et le traumatisme moral, ce dernier produit les mêmes effets, aboutit aux mêmes résultats. Je vous en présenterai seulement deux cas qui seront des types, et que je choisis entre un grand nombre qu'il m'a été permis d'observer.

Un homme ayant depuis longtemps des habitudes d'intempérance, commet dans des conditions tout-à-fait simples, ordinaires, un délit ou un crime. Il est arrêté : interrogé par le magistrat, il reconnaît sa faute, il a agi avec une entière connaissance de cause, il a prémédité, voulu l'acte, qu'il savait être un acte délictueux ou criminel.

Mais, au cours de l'instruction, pendant qu'il est en prison, soumis à la détention préventive, il est seul, en face de lui-même : les conséquences de ses actes au point de vue pénal lui apparaissent. Préoccupé, inquiet de sa situation, souffrant de sa captivité, sa santé se trouble, il perd le sommeil, l'appétit, et après quelques jours d'emprisonnement, il entre dans un accès d'alcoolisme aigu ou subaigu. Il a l'agitation, les visions terrifiantes, les tremblements fibrillaires des muscles, les symptômes caractéristiques de l'intoxication alcoolique. Cette explosion soudaine, eût pu être indéfiniment ajournée si cet homme avait continué à vivre au dehors, s'il avait conservé l'intégrité, l'équilibre de sa santé. Elle a éclaté du jour où cet équilibre a été rompu par l'action de causes morales dépressives qui ont aboli sa résistance à l'influence de l'agent toxique. En présence du trouble survenu le magistrat se demande s'il n'a pas affaire à un aliéné : le médecin consulté répondra que l'accès est transitoire, que d'ici à quelques jours il aura complétement pris fin ; et, sachant sous quelles conditions il s'est développé, il pourra dire qu'au moment du crime ou du délit, la responsabilité était entière. La connaissance exacte de semblables états est nécessaire. Il faut savoir qu'un homme peut avoir eu des accès de delirium tremens, et rester, avant comme après, responsable de ses actes. Si toute la période remplie par le délire est couverte par l'irresponsabilité, il n'en saurait être de même pour ce qui est en dehors d'elle. Il est bien entendu que je laisse de côté l'alcoolisme chronique, où des altérations cérébrales permanentes, durables, créent une situation toute différente.

J'ai eu à examiner un jour un homme qui représentait à Paris une grande maison de commerce de l'étranger : il avait falsifié ses écritures et commis une série nombreuse de vols au préjudice de son patron ; son médecin déclarait, de très-bonne foi, que cet homme avait été fou à plusieurs reprises, et il décrivait les accès de délire pour lesquels il lui avait donné des soins. Il pensait que cet homme n'était pas responsable de ses actes. Nous avons dû rechercher à quelle époque avaient eu lieu ces accès, et si les falsifications, ou les erreurs dans les écritures étaient contemporaines de ces accès. L'examen des livres de commerce nous démontra que les erreurs étaient volontaires, qu'elles avaient été commises à une époque où l'inculpé était en pleine possession de lui-même, que c'étaient bien moins des erreurs que des abus de confiance prémédités, exécutés avec habileté ; nous avons démontré que le désordre dans les idées et dans les actes n'eût jamais permis une série de faits régulièrement accomplis ; qu'aux périodes de délire correspondait une suspension complète des opérations commerciales, et nous avons conclu qu'il fallait considérer cet homme comme responsable de ses actes.

Pour revenir à la thèse que je soutiens devant vous, Messieurs, voici un fait très-

intéressant qui la confirme. Un homme de soixante ans, gardien depuis plus de vingt ans de l'un des passages de Paris, concourt à l'arrestation d'une dame dans des circonstances particulières. Cette arrestation fait beaucoup de bruit, la dame est mise en liberté, et cet homme craint d'être poursuivi pour arrestation illégale, et de perdre sa place.

C'était un buveur d'habitude : il ne s'énivrait pas, mais tous les jours, il prenait en assez grande quantité du vin blanc le matin, à jeun, de l'eau de vie, &c. Sous l'influence de ses inquiétudes, de ses préoccupations, il perd le sommeil et l'appétit, il prend de la fièvre avec de l'embarras gastrique, et est obligé de garder la chambre. Alors, éclate un accès d'alcoolisme subaigu. Il entend des voix menaçantes, il voit, dans sa chambre, des personnages à figures grimaçantes, il essaie en vain de les éloigner, il assiste à des scènes de violence qui le troublent profondément. Pendant cinq jours il reste dans cet état, puis, il se rétablit en apparence et reprend son service. Il n'était pas guéri, des idées délirantes de persécutions le tourmentent, il croit qu'on le regarde de travers, que les personnes avec lesquelles il est en relations habituelles, s'éloignent de lui avec mépris. Alors, il cherche d'où peut venir ce changement, et il demeure convaincu que son collègue a indisposé tout le monde contre lui. Un matin, il arrive chez lui, et lui dit : "Tu m'as trahi," et au même moment, il dirige sur lui le canon d'un revolver; on put lui saisir le bras, et l'empêcher de commettre un meurtre. La conviction délirante avait tout fait, et bien différent du délirant persécuté qui reste pendant des mois, des années, passif, et ne devient persécuteur à son tour que par suite d'une évolution lente de son délire, cet homme dans l'espace d'une dizaine de jours était sorti de la santé pour entrer brusquement dans la maladie par suite d'une préoccupation morale vive, d'un véritable traumatisme moral. Nous avons fait ressortir toutes ces considérations, et déclaré qu'il était irresponsable. C'était en effet du délire alcoolique et rien de plus.

Je pourrais, Messieurs, multiplier ces exemples, ils sont, on peut dire, d'observation journalière. Ceux que je viens d'avoir l'honneur de vous citer, suffisent pour établir qu'un choc moral, tout aussi bien qu'une maladie aiguë, une chute, une blessure, préparent chez un homme qui se livre habituellement à des excès alcooliques, l'explosion du délire qui eût pu être indéfiniment ajourné si l'équilibre de la santé n'avait pas été rompu.

DISCUSSION.

In the discussion that followed, Dr. ASHE, Dublin : remarked that he had seen symptoms of the same kind produced by moral shock alone, without any history of alcoholism; and Dr. BUCKNILL, London : insisted on the novelty and importance of the subject.—Drs. CLOUSTON, Edinburgh; and C. MERCIER, London : spoke of the violent mania often produced by alcoholism; and Dr. MAUDSLEY, London : inquired if there was any history of hereditary insanity or epilepsy in these cases, to which Dr. MOTET, Paris : replied in the negative.

Some of the Cranial Characteristics of Idiocy.

Dr. SHUTTLEWORTH, Lancaster.

The remark is not uncommon, even on the part of medical visitors to idiot asylums, that the heads of the patients do not, when casually surveyed, appear so abnormal in size and form as they had expected to find them. A study of the leading varieties of cranial abnormalities existing among idiots, especially such as are characteristic of typical varieties, may therefore not be devoid of interest.

Employing the word idiocy in its comprehensive sense, as including cases of infantile arrest of mental development as well as those which are congenital, it may be said that the *general* average of the measurement of heads of a large number of

idiotic children, and of a large number of normal children of corresponding age, will not differ very materially from each other. Thus, taking a series of 300 idiots and imbeciles at the Royal Albert Asylum, Lancaster, and of 100 normal children of the same social class at a neighbouring charitable institution, it was found that the average maximum head-measurements (circumferential) of groups of children of corresponding ages differed comparatively little in the two institutions, as shown in following table:—

Circumferential Head-measurements, given in Inches.	Ages. 5 to 10 years.		Ages. 10 to 15 years.		Ages. 15 to 20 years.		Average.	
Royal Albert Asylum Imbeciles	20·10	18·83	20·20	20·19	20·83	20·18	20·5	19·9
Orphan Institution Normal Children	20·89	19·73	20·70	20·60	21·25	21·25	20·87	20·33

Thus the general head-circumference at the Royal Albert Asylum was 20·5 inches (52·1 c.) and 19·9 inches (50·5 c.) for males and females respectively, as against 20·87 inches (53 c.) and 20·33 inches (51·7 c.) at the Orphan Institution. Examining the matter more closely, however, it would be soon apparent that the comparatively respectable average obtained for the head-measurements of the idiots was due to the abnormally large heads, which more than compensated for the abnormally small heads in the series.

We see then that mere *size* of head, save in extreme cases, is but of little help in the diagnosis and classification of idiocy. We may, however, often derive valuable aid from observing the varieties of cranial *form*. We shall, of course, find the most striking deviations from normal form amongst congenital cases. Perhaps the most remarkable of these is the microcephalic variety, which we will consider first. In different microcephals there are many differences of conformation, but there are, generally speaking, certain prevailing characters in the configuration of head and face. In the majority of cases which have fallen under my observation the skull has been oxycephalic, and the occiput imperfectly developed; the facial features have been well-formed, the orbit large, the eyes prominent, and the nose often of the Roman type. Sometimes there is a tendency to prognathism. The tapering forehead and prominent nose give to the physiognomy, in some cases, a bird-like aspect, whilst, in others, the expression has been compared to that of a beaver or a mouse. The so-called "Aztecs" are idiots of this type; and the portraits* and head-contours of the boy Freddy (a patient at the Royal Albert Asylum) show most of the characters alluded to. This boy, seventeen years of age, and 4 ft. 6 in. high, has a head, the greatest circumference of which is under 15 in. (38 c.). This boy is still living. In the case of another whose head-measurements were even smaller, and who died at ten years of age, the weight of the brain was but 13½ oz. (383 grammes). In another case of microcephaly, in which the head measured 17½ in. (44·5 c.) in circumference, the brain weighed 27½ oz. (780 gr.); and, in a third, with a circumference of 16¾ in. (42·6 c.) the cerebral weight was 21½ oz. (610 grammes).

The authority of the illustrious Virchow has often been quoted in support of the view that the cause of microcephaly is premature cranial synostosis. I am not sure that

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* Exhibited at Meeting; engraved in "Ireland on Idiocy," p. 93.

† For Head-contours of Microcephal (A. A., æt. ten) see Fig. 21, p. 612. Measurements—Circumference, 14⅛ in. = 35·8 c. From nasal notch to occipital protuberance over vertex, 9½ in. = 24 c.; Callipers, 4½ in. = 11·5 c. From ear to ear over vertex, 10 in. = 25·5 c.; Callipers, 3 in. = 7·6 c.

this opinion is held by him without qualification, but so far as my humble experience goes I am inclined to think that the premature synostosis is, as a rule, the consequence rather than the cause of the imperfect brain development. Such, at least seemed to be the case in an instance of microcephaly which I had the opportunity of pretty thoroughly investigating. As this case was fully described in the *Journal of Mental Science* for October, 1878, I will only now allude to it to say that the microcephaly depended upon some arresting influence having been brought into play to check the growth of the cerebral hemispheres backward and downward at about the sixth month of gestation, the development of the frontal convolutions having proceeded normally so far as the formative processes were complete. In this case the coronal suture was but imperfectly ossified though the girl was fifteen years of age. In another case (A. A.), a boy of ten, the anterior fontanelle seemed but imperfectly ossified and there was adhesion of the dura mater to that locality, and all along the inter-parietal suture.

Microcephalic idiots present many varieties as regards their mental condition, their intelligence varying to a considerable extent with the size of the head; but speaking generally it may be said that this class possess, as compared with other idiots, quick observation, expressive gesture, but deficient speech.

To pass to another well-defined type of idiocy, that known as the Mongol or Kalmuck type, we shall again find certain characteristic cranial and facial conformations. The skull is obtusely rounded, the longitudinal not much exceeding the transverse diameter, and the plane of the face and forehead, and that of the back of the head tend (as has been pointed out by Dr. Arthur Mitchell) to form parallel lines. There is, moreover, an obliquity of the superciliary margins of the orbits and an outward turning of the zygomatic arches together with a flat-bridged squat nose, which tend to impress on the patient the Mongolian aspect whence the name of the type is derived. Combined with these osseous abnormalities coexists a coarse papillated condition of the skin and tongue, the latter being transversely fissured, and there is a clubbed appearance of the fingers and toes. Dr. Langdon Down has spoken of ethnic degeneration in connection with this type; but, however this may be, the etiology is generally pretty clear. In these cases there is no hereditary mental taint, no consanguinity of parents to be traced, but in almost all it is found that there has been some lowering of the maternal vigour, either through ill health, advancing years, or, it may be, some depressing emotion during gestation. Idiots of this type are for the most part very imitative, they have a good ear for tune and time, and are capable of a fair degree of scholastic education. But their temperament is sluggish, and their vital powers feeble, and soon after puberty, if not before, they may be expected to die of some phthisical degeneration. The following are the measurements taken from the head of an imbecile of this type, thirteen years of age:—Circumference $19\frac{1}{2}$ in. = 49·5 c. Transverse, 13 in. = 33 c. Callipers, $5\frac{7}{8}$ in. = 14·5 c. Longitudinal, 12 in. = 30·5 c. Callipers, $6\frac{1}{2}$ in. = 16·5 c. Contours are exhibited in Fig. 2.

In cretinoid idiots, the large irregularly-expanded head, the distant orbits, and the depressed root of nose, co-exist with general heaviness, dulness of eyes, and wide and coarse nose and mouth, and a corresponding stupidity and slowness of comprehension. A special and peculiar class of these cretinoid idiots has been described by Curling, Hilton Fagge, and others under the name of "sporadic cretinism," and in these there is a more pronounced dwarfishness of body with a curious bagginess of skin, as if the bony skeleton were made on a smaller scale than that of the integument. The mental stature as well as the bodily is dwarfed, and there is a remarkable deliberateness about all their actions, and in their speech, which in many cases is moderately well developed. The physical resemblance to each other borne by idiots of this type is very striking.

I have not had an opportunity of examining post-mortem any example of the latter type; but Dr. Beach and others have described the existence of fatty tumours above the clavicle and the absence of thyroid enlargement as characteristic of these cases. I have indeed only had one autopsy of a cretinous patient, a lad twenty

Fig. 21.

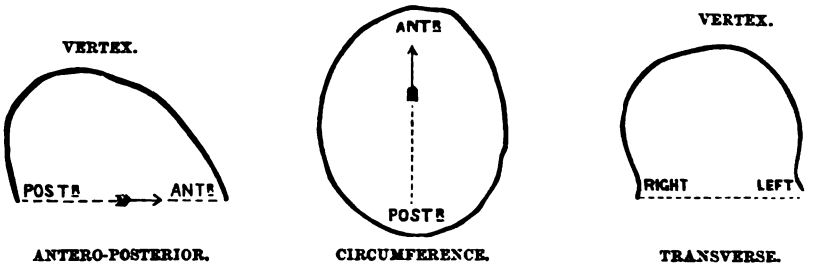

Fig. 22.

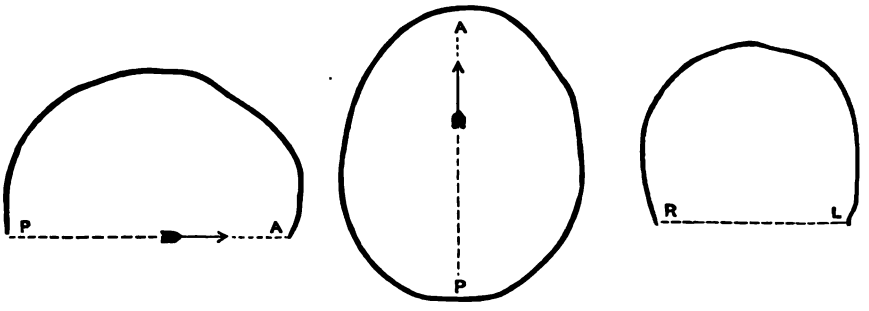

Fig. 23.

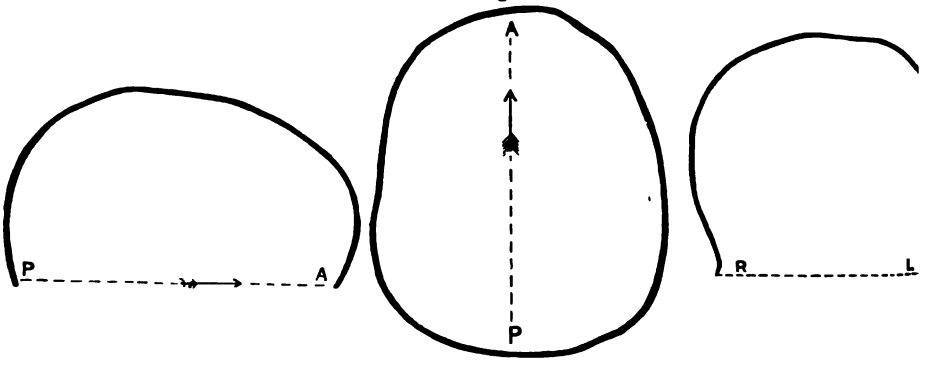

Fig. 24.

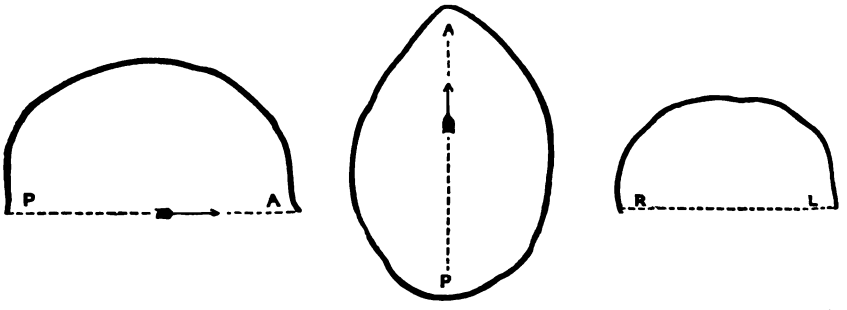

Fig. 21. Microcephalic Contours.—Fig. 22. "Mongol" Type ditto.—Fig. 23. Hydrocephalic ditto.—Fig. 24. Scapho-cephalic ditto.—All one-fourth real diametres.

years of age, 4 ft. 7½ in. high, who had enlarged thyroid, and presented the ordinary characters of cretinism, though born in Northamptonshire, in a district where cretinism is not endemic. In this case the sutures were all closed, nothing remarkable was noticed about the spheno-basilar bone—[the head measured 20¼ in. (51·5 c.) in circumference, 13¾ in. (35 c.) transversely, and 13½ in. (34·3 c.) antero-posteriorly]—though a horizontal position of the basilar process—*i.e.*, an absence of the occipito-basilar angle—has been noted by Lombroso, Fodéré, Ackermann and Niépce as one of the characteristics of cretinism. In the other variety alluded to (that somewhat confusingly called *sporadic* cretinism) a remarkable steepness of the clivus has been noticed by Virchow and other observers.

The cranial characteristics of hydrocephaly consist of a general obovate appearance of the crown looked at from above, the contour from back to front and side to side being more or less globular, and the greatest circumference being found at the temples, where there is sometimes a perceptible bulging. The back of the head is somewhat flattened. Imbeciles of this type, if not suffering from active disease, usually improve very considerably under training, and at last approach very nearly the standard of ordinary intelligence. This is exemplified in one of the cases whose head contours are exhibited, a lad of twenty-one, who, with the exception of a certain amount of childish curiosity and moral imbecility, may be described as cured.*

Resembling the hydrocephalic cases in size, though not in form of head, are those comparatively rare cases of hypertrophy of brain, which, when complicated with encephalitis, usually issue in a form of idiocy tending to pass into a variety of mania. Dr. Fletcher Beach, who has paid much attention to the subject of hypertrophic idiocy, gives the following as the points of cranial distinction between hypertrophy and hydrocephalus:—

"In hypertrophy of the brain the head does not attain so large a size as in chronic hydrocephalus. The head of my first case measured 23 inches in circumference, that of the second 22 inches. I have three cases of chronic hydrocephalus now in the asylum, and their heads measure 23½, 25½ and 25¾ inches respectively.

"In hydrocephalus the increase in the size of the head is most marked at the temples; in hypertrophy above the superciliary ridges.

"In hypertrophy the head approaches the square in shape; in hydrocephalus it is rounded (see outlines). In hydrocephalus there is often an elasticity over the late closed fontanelle; in hypertrophy there is none, and there is often a depression in that situation.

"In hydrocephalus the distance between the eyes is increased from the fluid inserting itself between and distending the sutures formed by the frontal and ethmoid bones; in hypertrophy this is not the case."†

Dr. West says this disease is usually associated with rickets. In the only case which I can bring forward—that of a girl of twelve—there are no signs of rickets. In this case there is frequent complaint of headache, and the progress at school is slow.

In some cases of paralytic idiocy, atrophy of the brain on the opposite side produces marked asymmetry of cranial contour. Dr. Ireland mentions an instance in which a very irregular outline of the left side of the head corresponded with want of power of the right arm and leg. That such asymmetry does not always obtain, is shown by the head contour of E. C., a girl twenty years of age, whose right hand and arm are atrophied and partially paralyzed, the right hand being barely two-thirds the size of the left, but in whom the skull is fairly symmetrical. It must indeed ever be borne in mind that cranial asymmetry is by no means necessarily a sign of deficient brain

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* *Head measurements: Hydrocephalic Imbecile* (*R. M., æt. twelve*).—Circumference, 23⅛ in. = 59·5 c. Transverse, 15⅛ in. = 39·5 c. Callipers, 4⅞ in. = 12·4 c. Longitudinal, 14¾ in. = 37·5 c. Callipers, 7⅝ in. = 19·4 c. Contours are exhibited in Fig. 23.

† *Journal of Mental Science*, April, 1881.

development; indeed I have heard, on the authority of a noted hatter, that men distinguished for intellectual power (Lord Chancellors and others), are the men who have the most uneven heads! (In proof of this assertion a number of "Hatter's Shapes," taken from the heads of ordinary customers, by the Conformateur, were produced and compared with outlines supposed to be characteristic of abnormalities).

Paralytic idiots, in whom there is no advancing disease, improve under training very considerably in intelligence, and those in whom athetotic movements exist, often possess a considerable degree of intelligence which is masked by their involuntary and ungainly contortions.

Scapho-cephalic heads, in which there is compression of the cranium from side to side with dolicho-cephaly, and a prominent ridge in the inter-parietal line and in the middle line of the forehead, are sometimes found amongst idiots. Pressure in parturition has been stated (I think erroneously), to be a cause of this distortion; but it is a condition normally found amongst the natives of New Caledonia, New Hebrides and the Caroline Islands. In the sporadic cases of scapho-cephaly, which have been examined in this country, a total absence of the sagittal suture has been observed, and Dr. Minchin ascribed the condition to the abnormal occurrence of only one central and vertical centre of ossification for the two parietal bones. Fig. 24 shows contours of a case of scapho-cephaly in a child one year old.

Traumatic cases vary so much in cranial characteristics and also in mental characters, that no general rule concerning them can be laid down. In one curious case I had under care, there was a large depression of the left occipital region, deep enough to admit the tips of two fingers, and at the autopsy the posterior part of the left hemisphere, which was thinned and elongated, overlapped the right.

The question of the influence of the use of the forceps on cranial deformity and resulting idiocy, can only be very briefly alluded to. Speaking generally, I concur in the conclusions arrived at by Dr. Langdon Down in his paper, read before the Obstetrical Society, that the forceps has but little to answer for in the production of idiocy. Protracted labour, unassisted by forceps and producing asphyxia neonatorum, is probably a much more potent factor of idiocy. Dr. Down remarked, that of 2,000 cases examined by him, only 3 per cent were delivered by forceps, though as many as 20 per cent were born with well-marked symptoms of suspended animation. In the first 600 cases in the books of the Albert Asylum, not more than 2 per cent are recorded as having been forceps deliveries, though I ought to add that of the last 250 cases (I know not from what cause), a much larger ratio of cases is *attributed* to the use of forceps—viz., about 4 per cent. In less than a quarter of the cases, however, are there any marks left by forceps.

The subject of artificial cranial deformations is one full of interest, but the only variety met with in this country is that produced by unilateral suckling, of which I have seen several examples, though the cranial asymmetry, which consisted of flattening of the parieto-occipital region on one side, was unaccompanied by any mental deficiency. It would appear that very considerable artificial deformation may be produced by prolonged, but comparatively gentle, pressure in one region of the skull, compensatory enlargement going on elsewhere, and no detriment to the intelligence resulting. The Flat-head Indians (Chinooks), are modern examples of this statement, which however was observed so long ago as the days of Hippocrates, with regard to the Caucasian Macro-cephali.

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*The Morphological and Histological Aspects of Microcephalic and Cretinoid Idiocy.**

Dr. Fletcher Beach, Darenth Asylum.

This paper is intended specially as a contribution to the subject of microcephalic and cretinoid idiocy. I had intended to add to it an account of atrophy of the brain in imbeciles, and briefly refer to some other cases, illustrating them by microscopical sections, but want of time has prevented me from carrying out this part of my subject. It appears to me, that by connecting the mental symptoms occurring during life with the appearances, both naked eye and microscopic, found in the brain after death, some advance may be made in our knowledge of the relation which the one bears to the other, and as usually the symptoms in idiocy are less complex than those of insanity, so we may hope for some success in the inquiry, and possibly aid in elucidating the more obscure relations between mental symptoms and brain states in the latter disease. Just as Broca has connected aphasia with disease, usually of the posterior part of the third left frontal convolution, or as some think of the operculum which is included between the ascending and horizontal limbs of the fissure of Sylvius, which immediately overlaps the island of Reil, and as motor paralyses of the limbs have been connected with disease of certain convolutions, by the labours of Hughlings Jackson, Ferrier, and others, and some light has been thrown upon the parts of the brain implicated in disease, involving loss of the sense of hearing, sight, &c., so we may hope in time by the same method to explain the mental symptoms occurring during life in cases of idiocy. Observation and experiment, the latter made for us by disease, have always been the means of elucidating the truth, and it assuredly will do so for us in medico-psychology, as well as in other branches of science. I am aware that it is held by some that disease affecting the mind cannot, and never will be explained by appearances found in the brain, and assuredly the attempt to do so will involve some labour and hard work, but I hold that it is better to make the attempt than to fold our arms and do nothing in that direction. The admirable researches of Bevan Lewis and Professor Betz, the latter of whom has made 5,000 sections of different parts of the brain in different individuals, show that the layers of nerve cells are differently arranged, not only in different convolutions, but in different parts of the same convolution, and mark a considerable advance in our knowledge of the subject. The study of the histology of the convolutions of the brain in health and disease is yet in its infancy; but, as time goes on, other facts will no doubt be made out.

To illustrate my subject, I have related in this paper two cases of microcephalic idiocy, and exhibit and describe the condition of the brain in both, adding to the latter case a short description of the microscopical appearances. The brain of the first case which weighed seven ounces when removed from the body is one of the smallest on record, and I have therefore given a full account of its fissures and convolutions. With respect to cretinoid idiocy, I propose to exhibit the brain of one case, the fatty tumours of another, and microscopical sections from a third.

E. R., aged eleven years, was admitted into Clapton Asylum, May 8, 1875, with the following history:—The parents were of temperate habits, sound mentally and physically, and not connected by consanguinity. There was no history of hereditary disease in the family. The child had a small head when born, and had at no time

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* The term Idiocy is used in this paper in deference to the opinions of those who made use of it when drawing up the list of subjects for discussion in this section, but the author believes the word Imbecility to be a far preferable one, as it includes all cases, both congenital and acquired, of mental defect, and avoids all difficulty in their classification, such as sometimes occurs when the words Idiot and Imbecile are used, for it is sometimes difficult to say under which heading a patient should be placed.

shewed much intellect. The mother assigns the patient's condition to the father playfully striking her across the forehead with a cod's head and shoulders when she was four months advanced in pregnancy. There are nine other children who are healthy and well-formed. Two of these are married, and their children present no defect. Two children have died, and of these one, the youngest in the family, was microcephalic, and died in Caterham Asylum, aged six years. The present is the eighth child. On admission, she was a fairly nourished child of dark complexion. Her head was very small. Her forehead sloped backwards at an obtuse angle, and there was prognathism of the lower part of the face. From the size of her head and her facial aspect, she was called by the nurses "the fish." Her hair which came low down on her forehead was light brown and erectile. Eyes blue, arch of palate high, tongue of normal size, teeth good, protruding beyond lips. Ears $2\frac{1}{2}$ inches in length, $1\frac{1}{2}$ inches in breadth. Her arms and legs presented many soft and downy hairs of a light brown colour. She was 3 feet $6\frac{1}{4}$ inches in height, and weighed 2 stone 6 lbs. No sign of rickets.

Fig. 25.

E. R., microcephalic idiot, from a photograph taken after death.

She could not stand or walk, though she could move her arms and legs about. There was no sign of paralysis, and she was not epileptic. Her sight was normal. She was quiet in disposition, obedient, and spent most of her time sitting in a chair in her ward. She passed her urine and fæces under her, and made so sign to have these wants attended to. She could not speak. She was fed with a spoon, and was entirely dependent on others for existence. After about six months' residence in the asylum, she became rather more intelligent, made an attempt to speak, and mumbled something indistinctly. She would put out her hand when told to shake hands, and would recognize, by a smile, the nurse and myself when we spoke to her. After about four months more she was noticed to grind her teeth when pleased, and when spoken to pretended to be shy, and put her hands before her eyes. Her habits became slightly improved. She was fond of her nurse. Observation, attention, memory, affection, and some power of voluntary movement were therefore present. On the day before her death she became suddenly collapsed, but recovered slightly. In the evening she became restless, and her breathing quick, and on January 24th, 1876, she died. She was twelve years old at the time of her death. The following are some measurements taken during life.

HEAD.

Circumference of head	12 inches.
Transverse diameter (between tips of ears)	$4\frac{3}{4}$ "
Root of nose to occipital protuberance	7 "
Tip of nose to auditory meatus	4 "
Occipital protuberance to auditory meatus	4 "
Root of nose to chin	4 "
Auditory meatus to chin	5 "
Auditory meatus to alveolar margin	$4\frac{1}{2}$ "
Height of forehead	2 "
Width of forehead	$3\frac{1}{2}$ "

BODY.

Tip of shoulder to elbow	8 inches.
Elbow to wrist	6 "
Wrist to tip of middle finger	$4\frac{1}{2}$ "
Anterior inferior spine of ileum to knee	11 "
Knee to external malleolus	9 "
Sole of foot (from heel to end of big toe)	9 "
Circumference of chest (one inch below nipples)	22 "
Circumference of abdomen	17 "

The autopsy was made forty-eight hours after death. Body thin, but not emaciated. There was a cyst over the left part of the forehead, the size of a large cob nut, and the thyroid gland was enlarged. The pubic hair was fairly developed. On examining the head, the vault of the skull was found to be arched, the occipital region flattened, and the forehead sloping. After the scalp had been removed, the sutures were examined. They were united, but the coronal was found to be much farther back than normal. On removing the calvaria and brain the base of the skull was inspected, and some measurements taken.

Anterior border of cranium to anterior clinoid process	$1\frac{1}{4}$ in.
Between clinoid processes	$\frac{3}{8}$ in.
From posterior border of sella turcica to posterior margin of cranium	$2\frac{1}{2}$ in.
Transverse measurement of anterior fossæ	$2\frac{1}{4}$ in.
Middle fossæ in length	$1\frac{1}{2}$ in.
Middle fosæ in breadth	$1\frac{1}{8}$ in.
Transverse measurement of cerebellar fossæ	$2\frac{7}{8}$ in.
Transverse measurement of interior of cranium	$3\frac{1}{8}$ in.

The form of the base of the skull was generally normal, but the floor of the anterior fossæ was more prominent than usual. The cerebellar fossæ were large and deep. The anterior and posterior clinoid processes were on the same level, and the descent from the latter was sharp and perpendicular. The suture between the sphenoid and occipital bones was soft, and could be cut with a knife. The palate was $2\frac{1}{8}$ inches in length, and was much narrowed perpendicularly. The incisor teeth were placed obliquely.

The brain weighed seven ounces. After preservation in spirit for six years, it weighs two ounces, and might be the brain of a good sized doll, rather than that of a child twelve years old. The different portions have not been weighed separately, as I have been anxious that members of the Congress should see it as nearly as possible in the entire condition.* It must be understood that the following description refers to the preserved brain and not to its fresh state.

The cerebrum when viewed from above is seen to approach the isosceles triangle in shape, being narrow and pointed in front, and of a somewhat square shape behind. There is an absence of the roundness seen in the normal brain, and the borders are

* This was afterwards found impossible.

narrow and angular. The upper surface is flattened. The two hemispheres are markedly asymmetrical. The left is appreciably larger and longer than the right, and is pear-shaped, while the right is more triangular. Of the lobes, the frontal and temporo-sphenoidal are well developed, the parietal fairly so, while the occipital are small, and chiefly developed on the under surface of the brain. As regards mass, on the left side, the temporo-sphenoidal are the largest, and next come the frontal, parietal and occipital, in the order mentioned. On the right side the frontal and temporo-sphenoidal are about the same size. The cerebellum, a large portion of which is uncovered, projects half an inch behind the cerebrum, and forms nearly a fourth of the entire mass, and gives a short ovoid appearance to the whole encephalon. Viewed from the base, the size of the cerebellum is again a marked feature. The temporal and frontal regions are well marked, the latter being triangular and pointed, while the former approach the oblong in shape. The orbital surfaces are only slightly excavated. The base as well as the upper surface is flattened.

Fissures.—The fissures of Sylvius (horizontal portions) are well marked and are very deep; that on the left side being $1\frac{1}{8}$ in. in depth, and on the right $\frac{7}{8}$ in. They

Fig. 26.

Brain of E.K., a microcephalic idiot—natural size—the sutures are not clearly shown as the membranes have unfortunately not been removed.

both have an oblique position from without inwards, but the left is more oblique than the right. The upper end of the left bifurcates to receive the posterior end of the supra-marginal lobule. The ascending portions of these fissures are not visible.

The fissures of Rolando are not so well marked as the fissures of Sylvius. The right is better marked than the left, and commences a little above the middle of the fissure of Sylvius; curves slightly round a projection of the middle part of the ascending parietal convolution, and terminates nearly $\frac{1}{4}$ in. from the longitudinal fissure. On the left side it is less perfect. Its commencement is faintly seen to commence $\frac{1}{7}$ in. from the upper end of the Sylvian fissure. After passing upwards $\frac{1}{4}$ in. it ceases, but $\frac{1}{7}$ in. further on recommences, being still faintly marked, and runs for $\frac{3}{8}$ in. towards the longitudinal fissure, the upper $\frac{4}{8}$ in. being well marked. It can then be faintly seen to curve for $\frac{1}{4}$ in. round the posterior part of the parietal lobule, then

runs backwards for $\frac{1}{4}$ in. (this part being well marked) and ends finally on the inner surface of the hemisphere.

Of the external perpendicular fissures the left is the better marked. It commences by a deep sulcus on the inner surface of the corresponding hemisphere, which a little in front has commenced to diverge from the right, and runs backwards and outwards for $\frac{1}{2}$ in., where it is interrupted by the first external connecting convolution. The right commences by a curve on the inner surface of the right hemisphere and runs almost transversely outwards for $\frac{3}{8}$ in., being joined at the outer extremity by a sulcus running at right angles to it, which separates the parietal lobule from the first external connecting convolution.

Of the great parallel fissures the left is deep, simple and well marked, and runs in a slightly curved line backwards for one inch. On the right side it is not so well marked and is slightly tortuous.

The callosal-marginal fissures are very different on the two sides. That on the left side is very simple. It passes backwards in a continuous curved line and reaches the surface of the hemisphere some distance behind the hinder end of the corpus callosum. On the right side it is interrupted by a convolutional bridge above the middle of the corpus callosum. It reaches the upper surface of the hemisphere on a level with the hinder border of that body.

The internal perpendicular fissures are also different. That on the left side descends obliquely, but is interrupted by a small convolutional bridge in the middle. On the right side it descends and takes two curves forwards (the curves being caused by projections of the quadrilateral lobule) and ends just above the posterior extremity of the corpus callosum. Neither of these fissures joins those of the hippocampi below.

The fissures of the hippocampi are not horizontal. On the left side the fissure is represented by two parallel ones running obliquely downwards, and separated by a thin ridge of convolutional substance. One, the longer, commences at the tip of the occipital lobe, the other, the shorter, commences $\frac{3}{8}$ in. below. Both join inferiorly a deep sulcus which represents the posterior part of the collateral fissure. On the right side it approaches the perpendicular in direction and commences with a slight curve a little below the tip of the occipital and then runs straight downwards.

The collateral fissure on the right side is marked by a very slight irregular depression. On the left side anteriorly there is a curved depression which is separated from the deep sulcus before mentioned by a layer of convolutional substance, $\frac{1}{4}$ in. in width.

With respect to these fissures, the Sylvian are shorter than in man (normal) or the ape. They are more vertical than in man, less vertical than the ape. Neither has an ascending branch. The fissure of Rolando on the right side is much in advance of that on the left in consequence of the smaller size of the latter hemisphere. On this side it is a simple, oblique, slightly curved sulcus more perpendicular than in man. On the left side it is interrupted in its course and less distinct. The external perpendicular fissures are interrupted by the first external connecting convolutions as in man.

Assuming the total length of the cerebrum to be 100, the relative length of the three regions—in front of the fissure of Rolando, between it and the perpendicular fissure, and behind that fissure—are in the preserved brain on the left side 61, 14, 25, and on the right 60, 20, 20. In the healthy brain the lengths are 54, 23, 23, and in the chimpanzee 49, 28, 23. The frontal part then of this brain is relatively the largest in both hemispheres and slightly exceeds the healthy ratio, while the parietal part is largest in the right brain, where it nearly reaches that ratio. It is only about two-thirds the proper size in the left hemisphere. The occipital region is slightly larger in the left hemisphere, which slightly exceeds the healthy ratio, but on the right side it is a little below it. Both frontal regions considerably exceed the corresponding ones in the chimpanzee; the left parietal region is only half the size of the region in that animal, and the right about two-thirds the size. The left occipital is a little above, and the right a

little below the occipital region in the chimpanzee. The parallel fissures are shorter than normal, but preserve the oblique direction. Of the internal perpendicular fissures, the right is the more tortuous, and oblique, and consequently marks a greater contrast with the vertical direction in the ape. The left is also oblique, but not to so great an extent as the right. Neither of the fissures of the hippocampi are horizontal, and that on the right side is nearly vertical and so approaches the quadrumanous form. On the left side it is anomalous in consequence of its division and its junction with the collateral fissure. There is marked asymmetry of all the fissures on the two sides of the brain.

Convolutions.—The orbital convolutions are very simple. The sulcus which lodges the right olfactory nerve is represented simply by an oval depression the size of a pin's head, and a small linear depression $\frac{1}{2}$ in. long, separated from the oval one by a small line of brain substance. The sulcus on the left side is absent. Instead of the triradiate sulci there is on the right side externally a short, deep, slightly angular depression $\frac{3}{4}$ in. in length, and internally a shallow, straight one $\frac{1}{4}$ in. in length. On the left side there is internally a deep straight depression nearly $\frac{3}{4}$ in. in length and externally a shallow one a little more than $\frac{1}{3}$ in. long. There is therefore asymmetry.

The three frontal convolutions can be distinguished on both sides, but are asymmetrical. The superior frontal on the left side extends backwards 2 inches in a longitudinal direction and is a simple broad band of brain matter, marked only by three depressions $\frac{1}{2}$ in. long in the anterior half. This convolution forms nearly half the frontal lobe. Its lower border in the anterior third of its course joins the upper border of the second frontal, which lies immediately below it. This (second) convolution is not so well defined in its posterior part. It is bounded above and in front by the first frontal, and posteriorly is separated by a shallow straight depression from the ascending frontal. Below it bifurcates and joins the anterior and posterior parts of the third frontal convolution which runs horizontally below the second and the first convolution. On the right side the first frontal extends backwards for $1\frac{1}{4}$ in. only and is absolutely without any depression on its surface. The second is placed perpendicularly below the first, which it joins by a thin convolution posteriorly. It also joins the upper surface of the third by its anterior inferior border. This second convolution is simply a broad band of brain matter with a curved depression $\frac{3}{8}$ in. long in its centre. The third runs horizontally below the other two, and is joined to both.

Of the two ascending frontal convolutions, the right is the better marked, but both are simple. It commences a little in front of the middle of the upper border of the Sylvian fissure, and in its upper third curves slightly backwards, becomes wider, and ends by joining the upper part of the ascending parietal. The outline of the left is not well marked below and in front. It joins the posterior part of the first frontal above.

The ascending parietal are much better marked, and of the two the right is the larger. Both are very simple, being straight convolutions, ascending on the right side from the middle, on the left side from the posterior part of the upper border of the fissure of Sylvius. There is a simple square parietal lobule on the right side, and a curved oblong one on the left.

The supra-marginal convolution, its lobule, and the angular convolution on the left side, are exceedingly small and form one single convolution. The lobule joins in front the ascending parietal and behind a branch from the first external connecting convolution, which forms the second external connecting convolution. Below, the angular convolution joins the upper part of the first temporal about its middle, $\frac{1}{2}$ in. posterior to the upper end of the fissure of Sylvius. On the right side they still form one convolution, but it is much larger. In front it is seen to join the lower third of the ascending parietal, while by its posterior surface it is connected with the second and third connecting convolutions. The angular portion joins the middle of the upper part of the first temporal, curving round the lower end of the Sylvian fissure. Posteriorly it is connected with the third external connecting convolution.

The *central lobe, or island of Reil*, is not distinctly recognizable on either side. On the left side there is a slight projection of brain substance, which may represent it, continuous with the lower part of the ascending frontal and the posterior part of the third frontal at the entrance to the Sylvian fissure. On the right side the projection is a little more prominent in the same position, having the same relation to the neighbouring convolutions. The *temporal convolutions* are much larger on the left side than the right, but are very simple on each side. The first is continuous in front and below with the upper part of the second, above, about its middle, with the second connecting convolution, and behind with the occipital by means of the third connecting convolution. It is separated from the third temporal below by the parallel fissure. The second is very small, measuring only one inch in length. It is continuous above in its anterior part with the first, and below, both anteriorly and posteriorly, with the third. The latter is the largest of the three, and is somewhat pear-shaped. Its upper part is situated at the lower and outer border of the hemisphere, being bounded above and in its posterior half by the parallel fissure. The greater portion of this convolution, is situated on the base of the hemisphere, where anteriorly it forms the body of the pear, so to speak, and is separated from the uncinate convolution by the collateral fissure which in this part is very shallow. A curved sulcus $\frac{5}{8}$ inches in length, is situated in the centre of this convolution. Posteriorly and inferiorly it joins the occipital. On the left side, the temporal convolutions are altogether smaller and not so well marked. The first is continuous, superiorly, and posteriorly, with the occipital by the fourth connecting convolution. The second is placed at the lower and outer border of the hemisphere, the greater part of it being situated on the base, and, owing to the contracted state of the brain here, is situated above the uncinate convolution. The third is continuous with the lower part of the second, by a fairly broad convolution, and then describes a simple semicircle around a large irregular opening $\frac{5}{8}$ in. long, and $\frac{1}{4}$ in. broad, which is the posterior part of the lateral ventricle. The posterior half of this convolution is placed below the occipital portion of the brain.

The *occipital convolutions* on the left side are represented on the convex surface by a narrow ridge of brain substance, connected in front with the parietal lobule and first and third temporal convolutions by the first, third, and fourth external connecting ones. The greater portion, owing to the narrow posterior border of the hemisphere, is situated on the base, where a triangular convolution having in its centre a small triradiate sulcus is present. No distinction of three layers of convolutions can be seen. On the right side, on the convex surface, a larger portion of brain substance representing them is present and a smaller portion on the base, but as on the left side, no distribution of three layers can be clearly made out. The portion on the convex surface is connected with the parts in front by means of the four connecting convolutions. Of the *external connecting convolutions*, the upper are the largest and completely bridge over the perpendicular fissure. The left is the larger of the two, and is relatively to the size of the brain a broad massive band. It gives off from its lower border a branch forming the second connecting convolution which joins the supra-marginal lobule in front, and the first temporal by means of a convolution below. The third joins the first temporal, and the fourth the third temporal. All are quite superficial. On the right side, the convolution is still large, and takes a sinuous course downwards and forwards to join the posterior part of the ascending parietal. Although its course is superficial, its junction is not, for a deep sulcus intervenes. The second is placed low down and joins the supra-marginal lobule; the third is blended with the fourth behind, but in front it joins the angular convolution, while the fourth joins the first temporal. The third and fourth are not so well marked as those on the left side. They are quite asymmetrical on the two sides.

The *marginal convolutions* on both sides are very simple, much more so than in the ape, being simple bands of brain substance, uninterrupted by transverse sulci, which run backwards and terminate on the left side, $\frac{1}{4}$ inch posterior to, and on the

right opposite to the hinder end of the corpus callosum. On both sides, owing to the large size of the frontal, and small size of the parietal, convolutions, they terminate in front of the ascending parietal convolutions—in fact, opposite the junction of the upper part of the ascending frontal with the ascending parietal. Above the corpus callosum the marginal convolution is joined, as usual, to the convolution of that body, on the right side, but the connecting band is absent on the left side.

The *convolution of the corpus callosum* on each side commences in the usual way beneath the genu of that body, and on the left side passes backwards and becomes wider, but its connection with the uncinate convolution cannot be made out. Instead, the smooth lower border of the convolution of the corpus callosum is continuous with the smooth lower borders of the quadrilateral and occipital lobules, and indeed there is a deep sulcus $\frac{1}{3}$ in. wide, between the lower border of the occipital lobule, and the posterior end of the uncinate convolution. The lower border of the convolution of the corpus callosum and of the quadrilateral lobule is bounded below by a thin ridge of brain substance $\frac{1}{2}$ in. long and scarcely the thickness of a wafer, which connects the posterior extremity of the corpus callosum with the posterior extremity of the uncinate convolution. On the right side the convolution becomes thinner as it passes backwards, and ends, a little posterior to the corpus callosum, by joining a thin band of brain substance, which is continuous with the anterior extremity of the occipital lobe. On this side, as before mentioned, there is a connecting bridge of convolutional substance passing from this to the marginal convolution. Both convolutions of the corpus callosum are absolutely simple, and without transverse sulci.

The *quadrilateral lobule*, the prolongation upwards and backwards of the convolution of the corpus callosum, is well developed on both sides. On the left it is continuous with the posterior and lower border of the convolution of the corpus callosum by a small convolution nearly $\frac{1}{4}$ in. wide. On the right side it sends forward a wedge-shaped ridge of convolutional substance to join the lower border of the marginal convolution at its posterior extremity. The lower border of this lobule is bifurcated by an intervening sulcus. The left lobule is not quite so oblique as it normally should be, but the right is nearly vertical, as in the ape.

The *occipital lobule* on the left side approaches the square in shape, and is divided below by a deep perpendicular sulcus, before referred to. It is otherwise perfectly simple. On the right side it is a long simple convolution, wide above, but becoming thinner below, which curves downwards and forwards, running beneath the quadrilateral lobule to join, by a thin band of brain substance, the convolution of the corpus callosum. Owing to the contraction of this part of the right hemisphere, both the quadrilateral and occipital lobules are placed much further forward than normal.

Of the *internal temporal convolutions*, the first on the left side cannot be seen. On the right side, in the open space before referred to, at the posterior part of the lateral ventricle, is a convolution the thickness of a wafer, and marked by a linear depression, which may represent it. It is connected posteriorly with the middle internal temporal. This latter convolution is much better marked on the left side than the right, but on neither side can the crotchet be seen. The lower internal temporal, which is the same as the lower external one, is well marked on both sides; but on the right side it is placed much further back than normal, owing to the contraction of the brain in this region. All these convolutions are simple.

Since the fissure of the hippocampi does not join the internal perpendicular fissure in either hemisphere, the *lower internal connecting convolution* is necessarily absent.

With respect to other parts of the brain, the pons, medulla, corpus callosum, crura cerebri, &c., are all present and well developed, considering the size of the brain. The corpora striata and optic thalami were not examined, in order that the surfaces of the brain might not be disturbed. As before mentioned, the cerebellum is much in excess of the healthy ratio.

Some measurements of the preserved brain were taken:

Left lobe-length (from tip of frontal to tip of occipital convolution).	3 inches
„ „ breadth (from upper end of parietal lobule to middle of third temporo-sphenoidal at widest part)	$1\frac{7}{8}$ „
„ „ height	$1\frac{1}{8}$ „
Right lobe-length (as above)	$2\frac{1}{2}$ „
„ „ breadth „	$1\frac{7}{8}$ „
„ „ height	$1\frac{1}{8}$ „

so that the left lobe is $\frac{1}{2}$ inch longer than the right, while the breadth and height of each lobe are equal.

Frontal lobe, depth	1 inches
„ „ width	$\frac{6}{8}$ „
Length of each orbital surface	1 „
From point of middle lobe to hinder end of brain, each side	$1\frac{5}{8}$ „
Projection of cerebellum beyond cerebrum	$\frac{1}{2}$ „
Cerebellum, breadth	2 „
„ length (in middle line where two lobes of hemisphere diverge)	$\frac{7}{8}$ „
„ depth	$\frac{7}{8}$ „
Greatest transverse diameter of brain	$2\frac{7}{8}$ „

Remarks.—With the exception of the lower internal connecting convolutions and the internal temporal, all are represented, though they are exceedingly simple, many being smooth elevations of cerebral substance, without any evident convolutional folding. The left external temporal show this folding the best, then the right external temporal, both frontal and the left occipital on the base, in the order mentioned.

Some parts are better defined than others; thus, the ascending frontal, and ascending parietal are best seen on the right side, but the occipital convolutions on the left. Both parietal lobules are well marked. The supra-marginal lobule and angular convolution are best seen on the right side, though they are simple on both sides. The island of Reil can scarcely be distinguished. The first external connecting convolution is well marked in both hemispheres: the second is best seen on the right, and the third and fourth on the left. The marginal convolution of the corpus callosum, especially the left, quadrilateral and occipital lobules, are well defined. The frontal and temporo-sphenoidal have the best definition, and then the parietal and occipital.

Many convolutions are not so highly developed as those in the fœtus at the sixth month in Gratiolet's plates, but they are more advanced than the one of $5\frac{1}{2}$ months. The cerebellum apparently has been developed after that of the cerebrum had ceased, so that there has not been arrest of development at a certain time, but irregularity of evolution.

The chief differences between this and the ape's brain are the marked asymmetry of the two hemispheres, the superficial condition of the four external connecting convolutions, and the absence of the upper internal connecting one seen in this brain. On the other hand, the deficient development of the supra-marginal lobule is important, as it is regarded by Gratiolet as peculiarly characteristic of man.

As to the relation between the state of the brain and the mental and bodily condition, it has been shown that although the brain is so small, the convolutions so simple, certain qualities of the mind, observation, attention, memory, and affection (the latter belonging to the emotional part), were present, corresponding with the relatively large size of the frontal lobes. The absence of speech is interesting, as the posterior part of the third left frontal convolution, the island of Reil, and the operculum, are very small. Her sight and hearing were good, and the centres governing those parts were well developed. Her power of movement was limited, corresponding with the small size of the ascending frontal and parietal convolutions.

It should be mentioned that in the description of the fissures and convolutions

of both of this and the other brains, Marshall's classification has been chiefly followed, and that no microscopical examinations of this brain were made, as the topographical anatomy was considered very important.

E. H., aged six years, was admitted into the Darenth Asylum on January 9, 1879, and died July 29, 1879. She was an illegitimate and the only child. Nothing was known of the father or his side of the family. The mother was a temperate woman, and up to the time of her trouble enjoyed good health; but she became very delicate and died eight months after the birth of the patient. The grandmother of the child was in a lunatic asylum, suffering from "softening of the brain." The mother was in great trouble during the time she was pregnant, and the labour was tedious and difficult. The child had had one slight convulsion before admission. When admitted she was found to be a fairly nourished, dark-complexioned child, two feet 5¼ inches in height. Her head was small, measuring 15⅔ inches in circumference, 9½ inches transversely between each auditory meatus, and 11 inches antero-posteriorly from the root of the nose to the occipital protuberance. Her hair came low down on her forehead, which was 3½ inches in width. She could walk about the ward, had perfect use of her limbs, and during her residence in the Asylum had no epileptic fits. She was of a happy disposition, easily pleased, and was very much attached to her nurse. She noticed what went on around her, was very sociable with the other children, but could not utter a word, though her hearing was good. Her habits were faulty. Though she could pick up and play with objects, she had no idea of feeding herself. She had a fair amount of observation and attention, as well as memory, the latter being shown by the fact that she remembered persons, particularly the nurse and myself. She was kept in the Infirmary during her residence in the Asylum, and did not attend school. Her health continued good up to a few days before death, when pneumonia of the right lung came on, of which she died.

At the autopsy, made forty-eight hours after death, her body was fairly nourished and her legs and arms hairy. The cranium was symmetrical, the sutures well united, but there was flattening of the occipital bone. The dura mater was very adherent, so that the portion covering the convex surface of the brain had to be removed with the calvaria. The brain weighed 20½ oz. The convolutions were simple, but by no means so much so as in many brains of microcephalic idiots. There was no congestion of brain or membranes, and no excess of fluid in the ventricles. After preservation in spirit for one year, the brain weighs 14½ ounces. It is, compared with the preceding brain, very highly organized, although the convolutions are much simpler than in the adult human cerebrum. It is as simple, if not simpler, than the infant's brain, and in shape is a short, rather than the long ovoid usually present. It is in convolutional arrangement very far in advance of the ape's brain, whose shape it does not resemble, for there is no narrowness and want of depth of the frontal region. The cerebellum is not only covered, but slightly overlapped by the hemispheres. The greatest length of the brain, measured from the tip of the frontal to the tip of the occipital lobe, is six inches, and its greatest breadth, situated about the centre, between the Sylvian fissures is 4½ inches. The brain is very small as a whole, but the occipital lobes are very slightly developed. The frontal, parietal, and temporo-sphenoidal are well developed. Supposing the total length of the hemispheres, as seen vertically, to be represented by 100, the part in front of the fissure of Rolando will equal 66, that between the fissure of Rolando and the external perpendicular fissure will equal 27, while the occipital portion will be represented by only 7. In the human brain the proportions are 54, 23, 23. The frontal part is therefore larger than usual, the parietal about the normal, while the occipital is only a third of the proper size. This occipital shortening probably accounts for the shortness of the brain from before backwards.

The fissures are all present and well-developed. The right Sylvian, however, in the posterior third of its course, takes a sharp turn upwards in an oblique direction. The

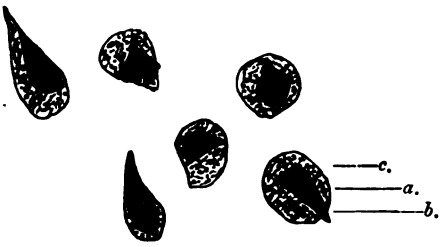
external and internal perpendicular fissures on the right hemisphere are half an inch posterior to those on the left, and the occipital lobe on the right side is correspondingly smaller. On this side, too, the calcarine fissure is separated from the dentate fissure by a much thinner ridge of brain substance (that connecting the convolution of the corpus callosum with the uncinate convolution) than on the left side. The calcarine joins the internal perpendicular fissure at a very acute angle, especially on the right side, so that the occipital lobule is very small, and the convolutions rudimentary. As to the convolutions, though simple, they are much in advance of some other idiots' brains which I have dissected. The three tiers of frontal convolutions are easily made out, but are differently arranged on the two sides. Thus, on the left side the first frontal consists of one long convolution joining behind the ascending frontal; in front the second frontal and below—about its middle—the same convolution. The second frontal is also a comparatively straight convolution placed immediately below the first, and joining, about its middle, the third, which approaches the triangular in shape, below. On the right side the first frontal is triangular, and joins the ascending frontal in its lower third. The second is placed below, and anteriorly is in front of the first, and is also of a triangular shape; while the third is circular, and is joined below and in front to the second. A deep sulcus, dividing the lower part in two, ascends in the centre of this convolution, and then bifurcates at an obtuse angle. The ascending frontal on the left side is simple, but on the right takes a curious course. About an inch from its commencement it divides into two broad convolutions; the anterior one ascends, and is joined to the posterior part of the first frontal, of which it may be said to form the posterior portion, while the posterior branch passes on in the usual direction of the ascending frontal, and joins the ascending parietal behind. This ascending frontal convolution looks, in fact, like a tree with two branches. The ascending parietal on the left side is very irregular. It is broad below, then becomes contracted, and receives on its posterior concave border the anterior convex border of the supra-marginal lobule, after which it again widens and passes on to be connected with its lobule, which on this side is nearly two inches long. On the right side it is in its whole length rather thin, and its lobule is not so long as the left. On the left side the supra-marginal lobule is very small, but the angular gyrus is of fair size. On the right the lobule is larger, and owing to the ascent of the posterior part of the Sylvian fissure on this side, it curves round its upper end. The angular gyrus is larger, and is posterior to that on the left side. The island of Reil is completely shut in by the sides of the Sylvian fissure on both sides. It is apparently very simple, but, as the brain in its neighbourhood is very soft, it is difficult to make out its outlines. The external temporal convolutions—with the exception of the first—are situated on the base of the brain, and the third is placed further back than usual. The connecting convolutions on the left side are well marked. The third and fourth, in consequence of the situation of the temporal, are lower down than usual. On the right side the first is not superficial in its whole course, but the second is so. The third and fourth cannot be made out in consequence of the injury to the brain, caused in taking it out of the skull where they are situated. The occipital lobes, as before mentioned, are small. The marginal convolutions are well marked. On the left side an intervening convolution joins it to the convolution of the corpus callosum about its posterior third. This is not present on the right side, and the posterior part of the marginal convolution is not so broad as usual. The corpus callosum is well formed. The convolution of this body on the right side has a larger crest than normal. The quadrilateral and cuneate lobes are well seen, but that on the right side, as before mentioned, is very small. The crotchets of the unciform convolutions are well marked. The left is the larger of the two.

The orbital convolutions are fairly developed. The cerebellum, pons and medulla are of normal size relatively to that of the cerebrum.

Some excellent microscopical sections of a portion of the frontal convolutions adjoining the orbital ones, were made for me by my friend Mr. Marsh, of the

Lincoln County Asylum, and the appearances found were as follows:—In the sections stained with logwood, a large number of leucocytes were seen, both in the grey and white matter, so that under a low power, with which they were best distinguished, only five layers could be made out. In the sections stained with aniline black, the first second and third layers were most clearly distinguished. The cells were generally round, sometimes pear-shaped, and the nucleus which was round or oval in shape, usually situated in the centre with a space around. Occasionally the nucleus was placed at the base. The space was sometimes clear, but more often nearly filled with faintly stained protoplasm. Only a few cells had processes, and these were small and stunted. This patient was considerably in advance of the preceding one in intellect, so corresponding with the better developed brain. As before mentioned, observation, attention,

Fig. 27.



Cells from third layer of cortex of frontal convolution of E. H., microcephalic idiot. *a.* nucleus. *b.* retracted protoplasm. *c.* granular matter. The retracted protoplasm and granular matter are represented too dark in the wood-cut.
Hartnack obj., No. 8, eyepiece, No. 4, tube drawn out. Fletcher Beach, *delt.*

memory and affection were present, and the frontal convolutions it will be remembered were well developed. This child however had perfect use of her limbs, as would be expected from the larger size of the ascending frontal and parietal convolutions in this case. Sight and hearing were good, and the angular and first external temporal convolutions were well marked. As to speech, the third frontal convolutions on both sides were comparatively small, and the island of Reil simple. We must remember in addition, however, that speech depends upon a perfect combination of fine muscular movements, so that not only must the centre from which they proceed be present, but its structure as well as the rest of the brain must be of good quality. In this case the part concerned was deficient in quantity as well as in quality, as shown by the microscopical appearances. The scarcity of processes, and the rounded shape of the cells particularly noticed in this and many other cases of idiocy, may ultimately be found to account in some manner for the deficiency not only of speech, but of ideas, in cases of low type, for if thought and ideas originate in nerve cells, an obstruction to their development would, of course, be caused by imperfect development of the cells, and want of deficiency of communication between them, in consequence of the scarcity or complete absence of cell processes.

Cretinoid Idiocy.—F. R., aged five years, admitted into the Clapton Asylum, October 1, 1875, and died, January 10, 1876, of bronchitis. The parents were healthy, but the father was very intemperate, being so even at times of coition. The maternal grandmother suffered from melancholia for six weeks at the change of life, and the mother was subject to neuralgia. The parents were not connected by consanguinity. The mother ascribes the child's condition to fright and trouble during pregnancy. She was born in London, has always been well fed, and the situation of the house is said to be airy. This is the eldest child. Two others have been born, one of whom has died, but they present no malformation. The mother had one miscarriage previously to the birth of this one. On admission the child was seen to

be a well-marked case of sporadic cretinism, the name given to these cases by Dr. Hilton Fagge. She was well nourished, of fair complexion, with brown hair, 2 feet $6\frac{1}{2}$ inches in height, and weighed 20 lbs. Her head was of an average size, flattened at the top, and spread out at the sides. It measured $20\frac{1}{4}$ inches in circumference, 11 tranversely, and $11\frac{1}{4}$ inches, antero-posteriorly. A depression could be felt in the position of the anterior fontanelle. Her face was, as usual in cretins, broad. Her forehead measured 4 inches transversely, and there was a distance between the tip of the forehead and the chin of $5\frac{1}{4}$ inches. Complexion sallow. Nose pug-shaped; scarcely any bridge could be felt. Mouth usually open, and tongue protruding. Lips thick. Arch of palate flattened. Teeth regular. No goitre present, and apparently no thyroid gland, but fatty swellings in the posterior triangles of the neck. The arms and legs were short and curved. There was some fulness of the wrists, but no bending of the ribs. Her skin was much smoother than usual, and could be easily separated from the subjacent tissue. Her countenance was usually vacant, but she would often smile when spoken to, though she could not speak. She was of a placid and quiet disposition. She could not stand nor walk, but spent most of her time in a chair. She noticed what went on in the ward, and generally seemed of higher

Fig. 28.

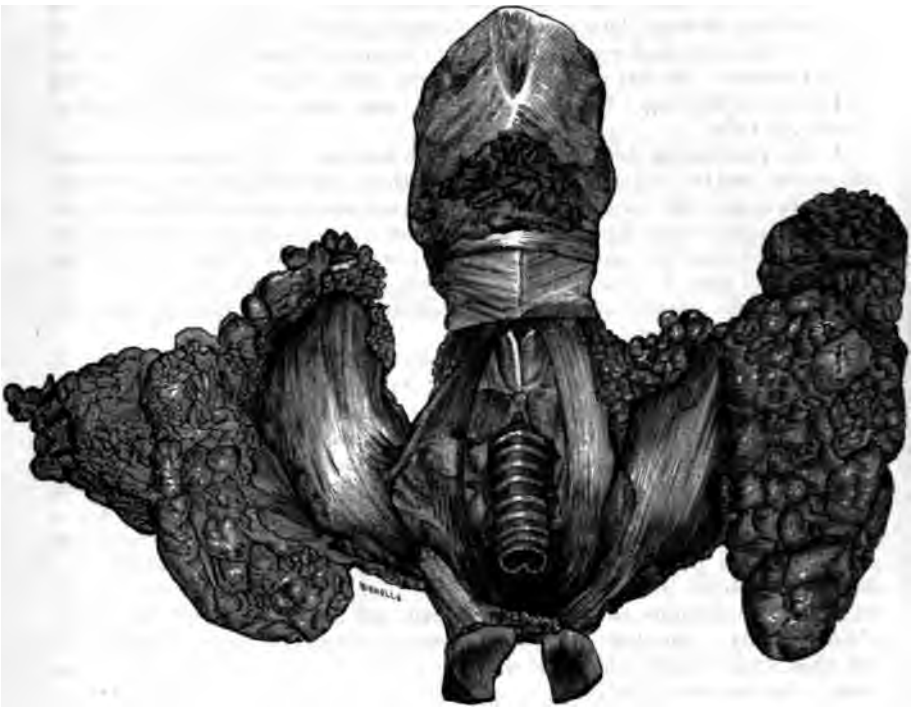
Cretinoid Idiot.

intelligence than another cretin who lived in the same ward with her. At the autopsy, the anterior fontanelle was found to be widely open, and there was a depression in front of it. The sutures were fairly united, their line of union being evident by congestion. When the calvaria and brain were removed and the base of the skull examined, it was found not to present the changes seen in the case of E. R. S., reported by myself, in the Pathological Transactions of London, 1876, in which the foramen magnum was seen to be smaller than usual and surrounded by an elevated ridge, the basilar process horizontal and narrowed laterally, and the cerebellar fossæ flattened. In this case the foramen magnum was of normal size, and there were very slight ridges around it. The clivus, or inclined plane, formed by the union of the basilar process of the occipital with the sphenoid bone, was very steep, thus corresponding with the case reported by myself, in the *Journal of Mental Science*, July, 1876.

The brain weighed 38 ounces. The convolutions were of normal size, differing from the two cases just alluded to, in which they were coarse (in one case $\frac{1}{2}$ in., in the other from $\frac{3}{8}$ in. to $\frac{1}{2}$ in. in width). The posterior lobes slightly overlapped the cerebellum. The ventricles were of normal size and contained no excess of fluid. Septum lucidum perfect. The brain was not at all reduced in size, and, to the naked eye, appeared healthy. The trachea showed no sign of a thyroid gland, but on the outer sides of the neck were two fatty tumours, small in size, pinkish in colour, and lobulated, without any investing envelope, sending processes upwards

and backwards, beneath the sterno-mastoid muscles, and downwards beneath the clavicles.

Fig. 29.



In the centre is seen the trachea with the sterno-hyoid and thyroid muscles turned aside. Outside these are the sterno-mastoid muscles and still externally are the fatty tumours.

P. C., aged 15 years, admitted into Clapton Asylum, May 14, 1875, and died January 31, 1878. His father was a delicate man, who is said never to have been very sharp, and who worried himself a good deal about trivial matters. His mother, a Dutch woman, was generally healthy, but suffered from bad headache at times. There is a history of phthisis in the family of the parents, who were temperate, and not connected by consanguinity. No family history of neuroses. The conformation of the boy's body is said to have existed, as now seen, at birth. The mother did not suffer from trouble during pregnancy. The patient fell on his head when six months old, but did not become insensible. He is the second son; there are seven others, all healthy, presenting nothing remarkable about them. On admission he was seen to be an idiot of the cretinoid type, but not of so marked a character as the preceding or succeeding case. His complexion was muddy. He was 4 feet 5½ inches in height, with a square head, measuring 21¾ in. in circumference, 13 in. in the transverse direction, and 15 in. antero-posteriorly. There was no sign of paralysis, but he was very slow in his movements. He did not suffer from epilepsy. He was able to speak, but did not say much. He was very pugnacious, continually fighting with the other boys. On both sides of the neck were fatty tumours, and correspondingly there was an absence of the

thyroid gland. He went to school in the asylum, but was very lazy and dull. An attempt was also made to teach him the trade of a shoemaker. At the end of 12 months be could spell "cat," "go," "to," could count to 7, and from 9 to 15. He knew the names of, and sometimes would distinguish, a colour. He had made no improvement in the shop. After another year's training, that is, at the end of 2 years, he could spell one or two more words and add 1 and 1, count to 12, and distinguish the blue and red colours. He had made, therefore, very little progress in school, as was also the case in the shop. He continued in the same state, and died of pneumonia, January 31, 1878.

At the post-mortem the body was found to be very fat. The cranium was thicker than normal, and the interior of the skull-cap, which was eburnated, was closely attached to the dura mater. The brain weighed 2 lbs. 15 oz., and was, therefore, of average weight. The convolutions, though more highly developed than in the second case of microcephalic idiocy, and the other two cases of cretinoid idiocy, were yet simpler than normal. The sulci were well marked. On further examination the fissures were found to be all present, and the convolutions of some degree of complexity. It is presented for inspection by the Members of the Congress.

On examining the trachea, some fat was found at the lower and front part of it, communicating on each side with lumps of fat, not encapsuled, in the posterior triangles of the neck.

F. T., aged nine years, was admitted into the Darenth Asylum, February 12, 1880, and died June 8, 1880, of pneumonia. The father died of inflammation of the lungs six months before the patient's admission. He had been a temperate man before the birth of this child, but three years ago took to drink. The mother was a temperate, healthy woman. There was a history of phthisis on both the father's and mother's side; a paternal aunt had died of epilepsy, and the mother had fits as a child. The paternal grandfather was paralyzed. Hereditary predisposition, therefore, not certainly to cretinism, but to an unstable brain, was markedly present. No history of consanguinity. The child is said to have had nice features up to two years of age, and, when fifteen months old, could walk round a chair, and was able to say a few words. As the result of whooping-cough when one year and eight months old, she lost the power of talking and walking. She was noticed to get fat when two and a half years old, and has been getting fatter ever since. She seemed to stop growing when seven years old, and has not grown an inch since. The cause of the child's condition is assigned by the mother to a fright by an insane gentleman during her pregnancy. It must, however, be stated that the mother lived, and the child was born, in a valley which was foggy and marshy, and the soil very chalky. On admission, the child presented the usual signs of a sporadic cretin as related in the case of F. R. The circumference of her head measured 19¾ in., transverse diameter 12½ in., antero-posterior 13 in., width of forehead 4 in. She was 2 feet 6½ in. high, and unable to stand, though she could move her legs. She could hold things, but not move herself about. Her hearing was dull, and she could not utter a word. Disposition placid and quiet. She was unable to swallow solids. She noticed me when I paid her my morning visit, but otherwise did not take much notice of what went on in the ward. At the autopsy, the cranium was found to be square in shape, and the sutures well united. There was a steep descent of the clivus, as in the case of F. R. The brain weighed 36 ounces. The convolutions were rather simple. Some admirable sections of this brain were also made for me by my friend Mr. Marsh. In the logwood stained sections, a large number of leucocytes were noticed, as in the microcephalic idiot, and five layers of nerve cells were made out both in these and the sections stained with aniline black. The cells were larger than in the case referred to, and the spaces also. In shape, they (the cells) were round or pyramidal. A few were without spaces, and these had an irregular, angular appearance. More of the spaces were clear than in the case of E. H., and those not clear presented faintly stained protoplasm. The nuclei were

round, oval, or irregularly angular. Many of the cells had no processes, some only one, and a few had three or four, but the processes in each case were stunted. Owing to the number of cells, with large spaces, a curious honeycomb appearance was produced.

Fig. 30.

Cells from third layer of cortex of frontal convolution of F. T., cretinoid idiot. *a.* nucleus *b.* retracted protoplasm. *c.* granular matter. The retracted protoplasm and granular matter are represented too dark in the woodcut.

Hartnack, obj. No. 8, eyepiece No. 4, tube drawn out. Fletcher Beach, *delt.*

Cases of cretinoid idiocy are known by the peculiarity of their features, their stunted growth, usually the absence of thyroid gland, and generally the presence of fatty tumours in the posterior triangles of the neck. They are usually of a placid and quiet disposition, and although the boy P. C. was pugnacious, yet he was noticed when in school to be dull and lazy.

DISCUSSION.

The discussion on the two papers on Idiocy was opened by Dr. Huggard, London: who pointed out that extreme distortion of the skull (such as existed in some from Malikolo, recently exhibited by Professor Flower) had no tendency to produce idiocy, provided that the pressure is not sudden. He considered that this supported Dr. Shuttleworth in his belief that microcephalism is not due to premature synostosis, as Virchow supposed.

Dr. Ireland, Stirling: confirmed this last statement, pointing out that in some microcephalic heads the fontanelles are open and the sutures not united. He believed that idiocy is rarely due to the use of the forceps, and that harm is more frequently done by prolonged labour.

Dr. Dally, Paris: objected to the terms "Mongol" and "Kalmuck" as applied to idiots, for although there might be some superficial resemblance, idiots of this type had not the large, open orbit and heavy jaw of the Mongolian races.

Dr. Crochley Clapham, Sydenham: laid special stress on the deficiency of occipital development in idiots.

Dr. Shuttleworth, Lancaster: in his reply, stated that at the Royal Albert Asylum from 4 to 5 per cent. of the patients had heads measuring not more than 19 in.; and about the same proportion were of the Mongol type; cretinoid idiocy being very rare. He explained that he had used the term "Mongol," to designate a type of idiocy, not because he accepted the theory of "ethnic degeneration," but because having been

employed by Drs. Down, Mitchell, Ireland, and others, it conveniently distinguished the class referred to.

Dr. FLETCHER BEACH, Darenth: said that he had made measurements in reference to the development of the frontal portion of the brain. The frontal convolutions were well developed in idiots. In one case the proportions were 61 frontal, 14 parietal, and 25 occipital. In the healthy brain the proportions were respectively, 54, 23, and 23; and in the chimpanzee 49, 28, and 23. In another case reported by him the proportions were 66 frontal, 27 parietal, and 7 occipital. The question which Dr. Hack Tuke had brought under their notice as to the high palate was important. The true position was this: if they had an idiot brought before them with a vaulted palate, they could say the case was a congenital and not an acquired one, and in practice this would be found an important point.

Cerebral Localization and Hallucinations.

Professor TAMBURINI, Reggio Emilia.

Professor TAMBURINI read a short paper on "Cerebral Localization and Hallucinations," of which the following is a sketch:—

He began by pointing out that the first discovery of a sensory centre (that of sight) in the cerebral cortex was due to Panizzi, in 1856, but the full development of the discovery is due to Professor Ferrier. He reviewed the various theories which would ascribe hallucinations to disorder of the peripheral organs, of the optic thalamus, and of the sensory cortical centres, concluding that the latter is the only view consistent with the present state of physiology. He proceeded to support this by relating three cases in which there had been persistent auditory hallucinations during life, and after death Ferrier's auditory centres were found diseased. He brought the subject forward in order to support Professor Ferrier's teaching, and to urge others to further inquiry.

DISCUSSION.

Dr. FERRIER, London: referred to experiments already shown in the Physiological Section, as proving to demonstration the existence of an auditory centre; and he was almost equally certain that there were similar centres for the other senses. He believed that hallucinations were due to morbid excitement of these sensory centres, in the same way as convulsions are produced by excitement of the motor centres.

The Brains of Criminals.

Dr. BENEDIKT, Vienna.

Dr. BENEDIKT read a paper on "The Brains of Criminals," of which the following is an abstract:—

With the view of supplying a new element in the science of physiological psychology, I have collected more than 40 brains of criminals, and have brought here 48 hemispheres, from 37 brains. These brains are not selected, but are those of all the persons who died in a certain prison during a certain time. It will be seen that they differ from the normal (typical) brain chiefly in this, that the fissures tend to run together, instead of

being separated from each other ("the type of confluent fissures"). These confluences cause the human brain to resemble that of monkeys; in particular it will be noticed that in nineteen cases the scissura hippocampi (sulcus dentatus) is connected with the united parieto-occipital and calcarine fissure; and in two cases the calcarine fissure is separated from the parieto-occipital:—both of these being characteristics of the simian brain. The calloso-marginal fissure, again, frequently enters the quadrate lobe, and may extend as far as the scissura hippocampi.

Another interesting peculiarity is the formation of another fissure, which proceeds from the Sylvian fissure, dividing the external portion of the frontal lobe from its basal or orbital part. This I have named the "external orbital fissure;" traces of it are to be found in healthy human brains, but in animals it is important, having been supposed by Boza to be represented by the central fissure in man.

The type of four gyri has attracted more notice from French and Italian authors: this is sometimes produced (as I formerly supposed to be always the case) by division of the first frontal gyrus, sometimes (as Mr. Hanot believed) by division of the second: sometimes both are divided, producing a type of five gyri. It is also interesting to remark that in these criminal brains the cerebellum is often either wholly or partially uncovered by the cerebrum.

These examples will prove that there exists another type of human brain, divergent from the normal one, and that most of my criminal brains belong to that type; they are also of use in assisting us to identify the several fissures in man with those in the lower animals.

DISCUSSION.

Dr. Crichton Browne, London: considered that the brains demonstrated by Dr. Benedikt were merely brains of a simple type, differing in no respect from ordinary brains which were imperfectly developed. He expressed his belief that the author would be unable to pick out twenty brains of criminals which had been mixed with a hundred brains of ordinary people.

Dr. Dally, Paris: urged that in examining the causes producing habitual criminality, it is unreasonable to concentrate the attention upon the cerebral characteristics of the individual, disregarding his social relations, which were more *important factors*.

On Unilateral Hallucinations and their Relation to Cerebral Localization.

Dr. Alexander Robertson, Glasgow.

Dr. Alexander Robertson read a paper on "Unilateral Hallucinations and their Relation to Cerebral Localization," of which the following is an abstract:—

It has long been known that hallucinations may be one-sided, and this is shown by reference more particularly to the writings of French and German authorities. It appears from their statements that such cases are considered to be very rare; but it is maintained in the paper that their rarity is more apparent than real, and is due to the point having been seldom investigated, at least in the form and stage of insanity when one-sided hallucinations are most frequently present. A short abstract of the conclusions of a former paper by the writer on the subject, read at the annual meeting of the British Medical Association, in 1875, is then submitted, and is followed by brief

details of cases since then observed by him. These yield a basis for general considerations respecting the pathology and relations of this class of phenomena. Care is taken to include only such cases as are of cerebral origin; those in which there was disease of the sense-organ, or where there was ground for believing that peripheral disease had crept up along the nerves to the cerebral centres are excluded. It is stated that one-sided hallucinations are most common in the forms of insanity due to alcohol, particularly when they are the result of recent excesses. The degree of frequency of unilateral, as compared with bilateral hallucinations, is considered, also the comparative liability of the respective senses, and the reason why the unilateral forms should preponderate so greatly as they do in the auditory sense. The fact that they are much more common in the left than the right ear is also noted.

The question, How does it happen that the centre for one side is implicated, while the other is free? is discussed. Much light is thrown on this and other points in cerebro-mental disorders by a study of Sir James Paget's philosophical views on general pathology. A part that is congenitally weaker, or has been enfeebled by disease, is apt to be affected first, and to suffer most, when a general morbid action arises in the system. This is illustrated from the writer's practice. In unilateral hallucinations the special centre involved is held to be weaker on the one side than the other, through some cause, either congenital or acquired, and such an agent as alcohol in the blood acts with special virulence on this part. From this point morbid action spreads, generally involving the mind as a whole.

The psycho-sensorial centres in the convolutions are held to be affected rather than the centres of special sense in the sensorium. It is urged that the general mental disturbance which in a greater or less degree almost always accompanies the hallucinations, or at least quickly supervenes on them, points very distinctively to the supreme centres as the seat of the disorder. In this connection the fact is alluded to that not infrequently auditory hallucinations, both unilateral and bilateral, persist for a day or two after positive insanity has disappeared, and is considered to show that healthy action has been everywhere restored, save in the solitary supreme centre, or centres for hearing.

Attention is directed to the analogy presented by certain motor disorders, particularly jumpings of the legs and body generally, which are occasionally marked symptoms in the initial stage of mania. In relation to the mental disorder, these seem to point to the motor convolutions as the centre of morbid action. The psycho-sensorial phenomena under consideration are probably associated with some other portion of the cerebral surface. But though we know the position of the motor centres, we are still in ignorance of the localization of the special senses. Ferrier, no doubt, indicates with great precision their probable site, and cases are recorded which seem to bear out his conclusions; but the number of these cases is small, and the results of other observations are not in harmony with Ferrier's views, &c.

Mental Stupor.

Dr. Hack Tuke, London.

I wish to bring under your notice to-day several cases of mental stupor for the purpose of raising the question of their true nature, and the nosology of mental stupor in general. These cases presented marked cataleptic symptoms.

I here use the term "mental stupor," as synonymous with the French "stupidité," which, as you are aware, comprises all that we understand as acute dementia and melancholia attonita or cum stupore, whether with or without catalepsy.

These cases were admitted into Bethlem Hospital, two under Dr. Williams' and one under Dr. Savage's care, to whom I am indebted for permission to use them. They were frequently examined by myself.

One was a young woman between nineteen and twenty, a school-teacher, who suffered severe disappointment from failing in an examination. Mental symptoms developed themselves not long afterwards, and in two months she was admitted into Bethlem. There was no family history of insanity. She herself had never had fits of any kind, epileptic or hysterical.

The early symptoms were marked by what was regarded as sullen behaviour.

Then she had distinct hallucinations that she saw the devil and that she heard some one whispering to her not to pray; and laboured under the delusion that her soul was lost. She then became silent, obstinate, and refused her food. To one of the medical men who signed her certificate, she whispered that she heard the clanking of chains and that she wanted to do penance for her sins. To her father she said she was in great misery and in dread of eternal punishment.

Up to the time of admission into Bethlem Hospital, menstruation was regular, but during the previous catamenial period she had caught cold, and after admission the catamenia ceased. Amenorrhœa therefore did not stand in the relation of cause to her attack.

Her condition after admission was as follows:—

She did not respond by word or gesture to questions, but it was inferred from increased tremor of the eyelids and slight suffusion of the face that she was conscious to some extent at least, of what was said to her.

She sat or stood motionless, perfectly passive. Her eyes were shut, and there was generally a quivering of the lids. On raising the latter the globes were found to be strongly directed upwards and inwards, and the pupils moderately dilated. From their position it was difficult to determine their reaction to light. Her mouth was partly open, the saliva constantly dribbling down upon her dress. The facial expression as a whole was a blank.

The hands were somewhat cold and blue, but not to the degree so often observed; and there were no chilblains. The clinical thermometer did not indicate anything abnormal, the pulse was 72, feeble; the sphygmographic tracing, taken by Dr. Savage, normal.

Faradic reaction was found to be only about two cells below normal.

Tickling the soles of the feet produced some, but diminished, reaction.

With regard to general sensation there was well-marked loss of sensibility in the upper extremities; not so pronounced in the lower. Blood was slow in following the prick of a pin, which could be introduced into any part of the arm or neck without the slightest indication of feeling.

The finger could be passed over the conjunctivæ without any resistance or flinching.

No tender spots on the chest, ribs, or back were made out, and there did not appear to be ovarian tenderness.

Passing to the motor system, it was found, on raising her arms, that they remained in the position in which they were placed for a very considerable time. There was no more rigidity than served to support them in their position. The hand or fingers could be moulded in any direction desired, so as to present a fair example of flexibilitas cerea. Although the arms thus preserved their position and for so long a time, it was easy to bring them down again, with gentle pressure. The lower extremities were much less cataleptic.

If the patient was made to stand, she remained in that position an indefinite length of time; never walking unless pushed forward.

She had to be dressed and undressed, being as passive and powerless as a doll, and required to be fed with a spoon.

She did not attend to the calls of Nature.

This description will, I hope, convey a tolerably clear notion of the case, but you will see better by this photograph the appearance she presented when her arms were raised and her mouth was open. (*Photograph exhibited.*)

The two other cases to which I have referred were young men, but I will not occupy your time in describing their symptoms, because their close resemblance to that which I have given renders it unnecessary. I may observe, however, that one of these cases stood like a sign-post with extended arms, inanimate, regardless of all that passed around him, a pitiful object, with only the whites of his eyes visible. Slavering like an idiot, and wholly careless of personal cleanliness, it seemed as if the mind was an utter blank. It was not, however, the blank of dementia, and the term "acute dementia" is on this account misleading in such cases. Moreover, dying of phthisis, he conversed rationally with his relatives during some weeks prior to his death. In this case M. Roussel tried the effect of transfusion of blood, but without decided benefit.

The other patient was removed to Hanwell and remains there under Dr. Rayner's care, but not in his former cataleptic condition. (*Photographs of both exhibited*).

Taking the classification of the French, who comprise under the generic term *stupidité*, three varieties, one arising out of melancholia in which painful delusions more or less persist and dominate the physical signs; another in which it results from moral shock, depression of the vital powers, epileptic attacks, or as secondary to acute mania; and the third, *cataleptiform stupidité*, we have no difficulty in assigning these cases to the last-mentioned class; but as cataleptic symptoms are not peculiar to either of the other species—divisions which correspond to the terms melancholia cum stupore and acute dementia—we have still to inquire what is the mental condition of patients presenting the appearance which was present in these cases.

As a matter of fact different mental physicians do arrive at different conclusions on this point, and employ different designations. Amongst ourselves, some would call these patients excellent examples of acute dementia, others of melancholia attonita (or cum stupore); and this, in fact, occurred in these particular instances. I offer no apology, therefore, for bringing the subject under the notice of this Section of the Congress, and I do so in order to learn myself from others, with scant hope of adding to your knowledge. I ask you, therefore, to regard the *résumé* as affording points for discussion rather than dogmatic statements. As every one knows, M. Baillarger disputed the distinction between these states, and no doubt he succeeded in proving that careful inquiry of the patient after recovery will generally reveal the presence of painful delusions even when they were not suspected, thus reducing materially the number of cases of so-called acute dementia—a condition Esquirol says he rarely met with.

However, it will be generally admitted that there may be two different mental states by whatever name we call them, in one of which there is, for a time, a suspension of the mental powers generally; as from starvation, exhausting diseases, &c., while in the other, the patient is in the state of mind described by Sauvages, as long ago as 1745, as characterising melancholia attonita or cum stupore. "The patient," he says, "does not move from his place, and retains the same attitude. If he is seated, he does not

rise from his seat; if standing, he does not sit down; if lying down, he hardly ever sits up, or walks, unless he is moved by those who are standing by and is driven from the place. He does not flee from company. Asked a question, he replies not; *although he seems to direct his attention to what is spoken.* He regards not advice, as if he were deaf; he does not attend to objects of sight or touch. He alternately sleeps and watches; and eats and drinks what is put into his mouth *as if musing and distracted by cogitation on other matters.*"

Such a condition as this ought not to be confounded so long as it remains at this stage with the following, although both may be called states of mental stupor.

A woman, whom I have often examined at St. Luke's, used to stand with her head awry, her hands by her side, her eyes open without expression, and did not reply to questions. The saliva ran from her mouth, and the mucus from her nose, unheeded; she had to be fed and dressed, and altogether treated as a child. There was no indication of pain on being pricked, and no opposition to the finger being placed on the conjunctiva. No attention was paid to the calls of Nature, she was greatly emaciated, the skin of the hands cold and blue. The mental condition was apparently a blank, although there was not any evidence of incurable dementia.

These are typical illustrations or descriptions of melancholia cum stupore, on the one hand, and acute dementia as it is called, on the other, but with little reason, as I venture to think.

Exception may indeed be also taken to the former term, as applied to the description by Sauvages, for it seems at first sight a contradiction in terms, to speak of stupor in a case in which the patient directs his attention to what is spoken to him, and is "musing, and is distracted by cogitation;" and no doubt the expression is used here in a sense somewhat different from that in which it is frequently employed. But it has the support of classic usage, for Ovid employs it to describe a state of violent grief, which does not allow of tears ("fine carent lachrymæ, nisi cum stupor obstitit illis."—*Pont.* I. ii. 26), and it was employed by the Romans to indicate the condition of one lost in admiration, which is certainly inconsistent with stupor understood in a literal sense.

There may be the absorption of the whole being in a dreadful idea, the arrest of all action of the mind by one impassable impediment; the stoppage of mental traffic by reason of a waggon-load of care standing in the way, and blocking up the thoroughfare; or, to change the metaphor, out of the clouds in which the unhappy melancholiac is enveloped, a thunderstorm breaks over his head, which, instead of clearing his mental atmosphere, is followed by a lightning stroke, which leaves him fixed in one position of mind and body, for such was doubtless the idea of those who invented the term "thunderstruck melancholy"—melancholia attonita.

Absorption, even painful absorption, in woe, or a terrific delusion, may make a person oblivious to the outer world, and I take mental stupor to be a condition in which the re action to external impressions is more or less suspended and blunted for a time, the patient responding little if at all to questions, generally motionless, sometimes cataleptic, and frequently anæsthesic. When established, it is a form of mental disorder having its own special character, and is distinguished from acute melancholia by silence and immobility, and from true dementia by there being no certain evidence of permanent mental weakness.

Such a case is, or rather was, that of the woman at Bethlem, whose symptoms I have described, as also the other two cases in the same hospital. I believe that they had passed into a condition closely resembling, if not constituting, one form of somnambulism—chronic somnambulism as it proved—and that when we see persons in this state, it is utterly impossible to say whether the foundation of the case was laid in melancholia, or in simple mental exhaustion. At an earlier stage, the differential signs usually stated in textbooks, no doubt apply, and I cannot add to those given in the last edition of the "Manual of Psychological Medicine," but no test symptom can

be laid down at the later stage of which I speak, for the simple reason that the two states may then be identical. It will be said, perhaps, that there were in the Bethlem case all the signs of (so-called) acute dementia—a vacant physiognomy, dribbling saliva, inattention to the calls of Nature, and so forth; but all these might equally well occur in the stupor induced by melancholy, or in a prolonged cataleptic form of somnambulism. Moreover, I do not doubt that if this condition persists for long, it may pass into a state of actual mental weakness. How far the degree of Faradic reaction may assist in deciding between these states I am not prepared to say.

In this woman the cataleptic condition lasted about five months, then she slowly emerged from it, and recovery seemed probable; but unfortunately she relapsed, not into the cataleptic condition, but into one of childishness; to be succeeded by a return, to some extent, of the former cataleptic state. Anæsthesia is still well-marked, and there is a slight tendency for the arms when raised to retain their position.

It is in its relation to the prior melancholy fixed idea or morbid sensation, that I believe we have not sufficiently regarded the catalepsy which occurs among the insane. My belief is that dwelling upon a painful delusion may, in certain constitutions, or in certain states of the constitution, produce a cerebral condition in which the patient passes beyond an active or painful phase of thought, and is in very vague relationship to the outer world; a higher restraining and guiding centre becoming, so to speak, itself inhibited by a dominant idea or morbid sensation. The patient's actions are consequently at the mercy of others, or of his own inferior centres.

Thus, as I submit, the Bethlem girl being absorbed in the first instance in her own sombre reverie, glided into a self-induced hypnotic condition of the cataleptic variety. In some cases the course of events is as follows: uterine or sexual excitement; irritation transmitted through the sensory nerves to the brain and cord, affecting the mental functions, and by reflex action, disturbing the normal action of the muscles, and causing vaso-motor paralysis.

I may here say that, bearing in mind the case of catalepsy reported by Pau de St. Martin which recovered under hypnotic treatment, I repeatedly tried hypnotic manipulations upon her, with Dr. Savage's permission, but without any influence on the course of the disorder. The only point of interest was this: that her eyes being, as always since admission, shut, and the eyelids turned upwards, the manipulations which I employed were followed in the first experiment, by relaxation of the spasm of the eyes, and their opening widely, for about two minutes; the ordinarily blank face becoming for the time normally intelligent. Then the eyeballs resumed their usual position, the lids closed, and the face became again expressionless. Slight and fleeting, however, as was this success, the circumstance confirmed my opinion that in this, and similar cases, the patient is, pathologically, in a state allied to somnambulism, and that whatever explanation is ultimately found to be true of the state of the brain in the latter, as regards partial vascular changes or inhibition, will be found true also of the cases in question.

No doubt, in not a few cases of mental stupor, the muscles have a tendency to assume a cataleptic position, although such well-marked cases as those I have mentioned, in which other signs of catalepsy are present, are not in my experience very common, and I observe M. Dagonet speaks of cataleptic stupidité as rather rare.

On analysing fifty cases of mental stupor examined by myself or competent alienists, and which I have tabulated in respect to their mental, motor, and sensory state, I find that there were twenty-one, or forty-two per cent. in which the muscles assumed, in a more or less decided degree, a cataleptic form.

Of these, eight were cases in which the demented rather than the melancholic form of stupor presented itself at an early period of the attack.

One point to which I have specially turned my attention is the statement of the patient himself when he recovers, as to his mental condition during the time of his stupor.

Out of the fifty, there were twenty-one who gave more or less clear descriptions of their feelings during the time—these feelings being generally associated with some terrible delusion. The question of course arises, in relation to diagnosis, were there in any of these instances the outward signs usually attributed to acute dementia? Undoubtedly there were. Take one case, as illustrating the class, which I saw at Wakefield under Dr. Major. The expression of the patient was apathetic and indifferent. He stared vacantly at the questioner. The saliva dribbled from his mouth. The flies crawled over his nostril, or lighted upon his eyes, but he was perfectly indifferent. He never cared to change his position, however uncomfortable. He did not speak.

Was not this a case of acute dementia? The event proved that it was not. He said before his death that he had been perfectly well aware of all that had gone on around him, and that he had been labouring under the idea that the angels would not allow him to speak, and that he believed his food was poisoned. This explained both his silence and his refusal to eat.

I hold then that in some, if not many, instances it is impossible to tell whether we have before us what is called acute dementia or melancholia with stupor, notwithstanding the differential signs usually given to distinguish them, and I am not surprised to find that Dr. Mickle has for some time ceased to employ the term acute dementia. I certainly think it would be desirable to relinquish the use of the term, and to employ those of mental stupor and mental stupor with melancholia, respectively.

In one of his cases which I examined a few months ago, the patient, a man, had been admitted without any history, having been picked up as a wandering lunatic. His expression was vacant. He was silent. With these and others symptoms he might well have been entered as a case of acute dementia. But when he improved and was willing to speak, he said to Dr. Mickle that his idea was that he should be killed; and to me, he said, "I was afeared." The basis of the mental state then was a delusion of a melancholy character, although it had passed on to the stage which, as I have said, it is impossible to distinguish from that of acute dementia without that knowledge of the subjective life of the patient which he alone can give us after his recovery.

I would add, that of the patients whom I have collected in my list who described their condition during their stupor, several said that they had felt as if in a dream, others had felt as if spell-bound and so unable to speak, they knew not why: and some thought that they had got into the lower regions and were afraid to utter a word.

In regard to sex, twenty-four were males, twenty-six females.

The average age was twenty-seven.

As respects sensation, in twenty-four (forty-eight per cent.) it was certainly lost; probably the proportion was larger, the sensibility not having been always recorded at the time of examination.

The recoveries were nineteen in number (thirty-eight per cent.), and six died insane (only one of these being cataleptic). Of the remaining twenty-five, very few were hopeful cases. The large majority (eleven) presented the delusional form.

Of the six deaths, there were in four, post-mortem examinations, the appearances not being striking or uniform. In one there was marked œdema of the brain, which, as you are aware, has been frequently observed when cases have run a long course. If—being an effect—it does not throw light on their primary pathology, it is consistent with the stagnation or partial vascular changes in the brain already mentioned, and to which I have, as regards somnambulism, referred in the *Journal of Mental Science* as vaso-motor; the sympathetic being irregularly influenced by sensory and emotional impressions; different areas and their functions being thus in different states of functional activity.

It seems to me, that in trying to fix upon one case as acute dementia, and another as melancholia cum stupore, we are apt to forget that the *same* case may present these and even other forms of mental disorder. An examination of these fifty cases, from this point of view, shows that in quite a number of instances the

patient had passed through a stage of excitement, melancholia, stupidité, and dementia, thus bearing out to a considerable extent the circular character of the mental disorders with which motor trouble other than paralysis is often associated, as insisted upon by Kahlbaun in his memoir on Katatonia. By approaching the disease from the physical side, Dr. Kahlbaun has made the disorders of motility, and not the form of mental derangement, the essential part of the malady, and has studied rigidity, spasm, choreic movements, and catalepsy, as they occur in the insane, as affections analogous to the occurrence of general paralysis. In fact he does not trouble himself with the distinction between the different forms of mental stupor—does not pretend to diagnose between melancholia attonita and acute dementia—but takes the most prominent symptoms at the time as constituting the stage of what he regards as circular insanity. But I think he carries his views too far, and that as the morbid mental state conditions the motor trouble, it is right to take the former and not the latter as the basis of classification; at the same time, it is very important that in view of the psycho-motor centres, these motor and psychical (as also the sensory) troubles should be brought into relation.

In conclusion I would sum up by saying that I think the cataleptic variety of mental stupor (and probably other varieties also) is a condition to be regarded as caused by the exclusive direction of the mind upon a melancholy delusion, or if this is absent, from brain exhaustion due to various causes, calculated to paralyse volition, and allow of involuntary action, and that this state, when completely established, is no longer one of either melancholia or dementia, as regards the patient's actual mental condition at that time, although it may terminate in the latter.

Further, I believe that the more cases of so-called acute dementia are investigated, the more shall we be driven to conclude that in a much larger proportion of instances than is often supposed, they are examples of melancholia with stupor, the melancholiac having passed into either a state of hebetude which is identical pathologically with acute dementia, or of indifference to everything around him, accompanied by delusions; the physiognomy of indifference masking the painful feelings, and the discovery of the patient's melancholy delusions and hallucinations only being made by his physician on the recovery of the case.

Lastly, as to nomenclature, while I recognize the different mental states marked by an intensive and melancholic absorption of mind on the one hand, and by an utter blank on the other, the former blends so imperceptibly into the latter, and they so frequently cannot be distinguished until after the patient's recovery, that it appears to me more convenient to employ the term Mental Stupor as comprising both, qualified by the words "with melancholia" when we have certain proofs of this condition being present, thus getting rid of the term "acute dementia" altogether, which confounds the curable state in question with a form of mental disorder with which it has not necessarily any pathological relation.

DISCUSSION.

Dr. Foville, Paris: agreed with Dr. Tuke, that the term "acute dementia" was a misnomer; and, in fact, although introduced by the French, it was no longer used in France.—Dr. Crichton Brown, London: and Dr. Clouston, Edinburgh: believed there was an essential difference between the two mental states in question, and the latter hesitated to admit the analogy between somnambulism and any form of mental stupor.

An Experimental Study of Hypnotism.

Professor TAMBURINI, Reggio Emilia.

Professor TAMBURINI read a paper on "An Experimental Study of Hypnotism," of which the following is an abstract:—

Ces recherches, que j'ai faites avec la collaboration de M. Seppilli, ont eu le double but, d'éclaircir quelques points de l'hypnotisme et d'établir des faits objectifs qui pourraient écarter la simulation, dans l'intérêt de la médecine légale.

La première série de recherches portait sur une fille de 28 ans, hystérique: en voici les résultats les plus saillants. Tous les phénomènes d'hyperesthésie musculaire (contractures, &c.), se sont montrés plus marqués du côté droit que du côté gauche. En même temps que les contractures, une analgésie de tout le même côté du corps se produisait. Avec une flexion forcée plantaire, cette analgésie disparaissait et était suivie par une contracture diffuse des muscles latéraux de la poitrine, avec respiration stertoreuse et cyanose de la figure; et cet ensemble de phénomènes durait quelques moments.

Pour l'examen des phénomènes respiratoires et circulatoires pendant l'hypnose, nous avons employé le pneumographe de Marey et l'hydrosphygmographe de Mosso. Il est facile de voir, dans les tracés graphiques que je vous soumets, que pendant le passage de la veille au sommeil hypnotique, la respiration devient plus profonde, fréquente et irrégulière; la fréquence est d'abord doublée, la pause inspiratoire supprimée: en même temps le cœur bat plus vite et plus fort. L'application de l'aimant à une distance de 3 à 4 centimètres du thorax ou de l'épigastre produit presque toujours de profondes modifications. Le plus souvent, immédiatement après l'application, on constate un arrêt des mouvements respiratoires; une vraie *apnée* qui se prolonge plusieurs secondes: quelquefois cette pause est précédée d'une forte inspiration. D'autres fois, nous avons observé un accroissement notable dans l'amplitude des excursions thoraciques, ou bien un ralentissement sensible.

L'enlèvement de l'aimant s'accompagne presque toujours d'un mouvement inspiratoire profond, suivi d'amples excursions thoraciques. Les simples pauses ont suffi pour modifier la respiration dont les mouvements sont devenus plus faibles et plus fréquents.

L'application de l'aimant à la région cardiaque excite les mouvements du cœur.

On verra que ces observations vont à l'appui de la théorie qui rapproche l'hypnotisme l'hystérie et la métalloscopie, et qui les fait consister en modifications moléculaires du système nerveux.

Gouty Insanity.

Dr. RAYNER, Hanwell.

Dr. RAYNER read a paper on "Gouty Insanity," of which the following is an abstract:—

It is remarkable how few cases of insanity are ascribed to gout; and in the absence of any statistics of the frequency of gout in the population at large, it is impossible to do more than assert my belief that gout is as frequent a cause of insanity as of any other disease.

Dr. Berthier, in 1869, seems to have been the first to collect the recorded cases of insanity from gout, which proved (what I had previously concluded) that every form of

insanity may be thus produced. My object will be to support Dr. Berthier's views, and to show the ways in which gout seems to produce insanity. The retrocession of gout has been frequently observed to produce insanity; the commonest condition being mania, very sudden in its inset, and rarely lasting long, recovery being ushered in by an attack of gout. A case is related of this kind.

Two cases are related where the gout had taken the "atonic" form—that is, the joints having ceased to be affected owing to general debility. Here the symptoms were hallucinations of sight and hearing, producing great suspicion and distrust; the patients recovering after an attack of gout.

There is yet another condition where gout may produce insanity; where the joints, having been extensively affected, are incapable of giving the relief which formerly followed their inflammation; this may be termed "restrained," or "inpent," gout. In such a case as related the delusions were at first exalted; these were soon followed by a state of melancholy, which disappeared after an acute attack of gout consequent upon great improvement in health.

In these, and two other cases, where gout played a part in the causation of insanity secondary to plumbism and alcoholism, I have noticed two remarkable physical symptoms. The first is a remarkable prominence of the eyes, especially marked in the atonic and restrained forms: the second is an extreme darkness of complexion, more particularly in melancholic cases. Both of these symptoms diminish as the health improves; they may be seen in other cases of insanity, but only when we have reason to suspect the blood is insufficiently depurated.

I am led, on the whole, to the following general conclusions:—

1.—Protracted gouty toxæmia, when not very intense, usually results in sensory hallucinations or melancholia:—

2.—Sudden and intense toxæmia results in mania or epilepsy.

3.—Intense and protracted toxæmia usually results in general paralysis.

4.—If there is a tendency to vascular degeneration, from plumbism, alcoholism, &c., varying degrees of dementia are produced.

DISCUSSION.

In the discussion which followed, Dr. Savage, London: expressed himself as a convert to the belief in gout as a cause of insanity; and Dr. Crichton Browne, London: stated that he believed or insanity only occurred in gouty patients who were hereditarily predisposed to insanity or epilepsy, when the nervous disturbance produced may pass on into actual insanity. He connected many cases of melancholia attonita in young girls of feeble circulation with inherited gout.

Epilepsie.

Prof. Lasègue, Paris.

En vous parlant de l'épilepsie je ferai moins une communication qu'une démonstration; toute étude d'une maladie est confuse si on n'a d'abord fixé sa nosologie. On doit admettre nosologiquement et cliniquement deux grandes classes d'épilepsie: les vraies et les fausses.

La première comprend: l'épilepsie par malformation du crâne, c'est la vraie, la solennelle, celle qu'en empruntant un mot à la langue anglaise, on doit appeler *genuine*.

Au-dessous, l'épilepsie par déformation du crâne, déjà moins franche, consécutive à un traumatisme de la voûte crânienne et à laquelle la trépanation est applicable.

Dans la seconde classe plus confuse sont comprises les épilepsies fausses (*epilepsia spuria*) qui se divisent en :

1.—Epilepsie traumatique par le fait d'une lésion cérébrale sans déformation du crâne, commotion, &c.

2.—Epilepsie symptomatique d'une maladie inflammatoire ou organique du cerveau.

3.—Epilepsie toxique, saturnine, alcoolique, &c.

4.—Epilepsie hystérique se divisant en deux espèces suivant que l'un des deux éléments prédomine.

Toutes ces variétés s'éloignent de plus en plus du type, à ce point qu'on ait pu se demander si l'hystéro-épilepsie avait une affinité quelconque avec l'épilepsie.

Je veux dans cette étude détacher le premier groupe et l'envisager seul, c'est le vrai, le pur ; tous les autres peuvent lui emprunter plus ou moins de ses caractères, ils ne se confondent jamais avec lui. Ce sont, si vous me permettez cette comparaison, les actionnaires d'une maison de banque, ils ne sont jamais la maison de banque elle-même. Traduisant ma pensée par un thème, l'épilepsie sera représentée par une circonférence centrale, autour de laquelle gravitent les états épileptiques.

Chacune de ces formes prend à l'épilepsie vraie plus ou moins de ses caractères, elle lui emprunte plus au moins, jamais elle n'arrive à se confondre avec elle.

Dire d'une maladie qu'elle dépend d'une malformation crânienne, c'est énoncer un fait dont on ne doit pas attendre la démonstration "post mortem," il faut déterminer le fait du vivant même du malade.

Cette malformation n'appartient pas à l'enfance, mais à la période de consolidation des os du crâne, elle tient à l'évolution de l'appareil osseux de l'individu.

Dans l'enfance où la soudure n'est pas faite encore, il y a des compensations qui s'établissent et écartent les causes de compression.

Entre la 12e et la 20e année la consolidation se fait, se complète, c'est l'âge auquel l'épilepsie vraie apparaît. Rappelez-vous, Messieurs, les faits d'épilepsie que vous avez observés, les vraies, ils sont certainement de cet âge. A 40 ans, vous ne la rencontrerez plus jamais ; l'épilepsie de cette période de la vie est due à une blessure, à une affection cérébrale, elle se traduit par des crises épileptoïdes ; son évolution n'est pas celle de l'épilepsie.

Pas plus que le vieillard ou l'adulte, l'enfant du premier âge n'est un épileptique vrai ; il sera sujet à des crises terribles d'éclampsie, de convulsions, il deviendra un imbécile, un idiot, il subira toute sa vie les pires aventures cérébrales : il n'est pas et ne sera jamais un épileptique.

De 12 à 20 ans la tête se consolide, l'intelligence s'assied ; l'épilepsie survenant à cet âge, il faut constater si la tête est symétrique.

Les déviations limitées au crâne sont indifférentes et se compensent ; les déviations constatées aux os de la face ont la principale importance : elles indiquent l'asymétrie de la base du crâne ; or les compressions irrégulières exercées sur la base du cerveau expliquent l'épilepsie.

Tout homme asymétrique de la face n'est pas un épileptique ; mais tout épileptique frappé d'asymétrie appartient à la grande espèce. Les lois de son évolution sont les suivantes :

D'abord, elle n'est pas héréditaire tout au moins elle ne l'est pas plus que les autres malformations, le bec de lièvre, le pied bot, &c., et elle obéit aux mêmes lois de transmission. Dans une famille nombreuse, chez les consanguins, par exemple, un enfant, d'eux au plus, naissent malformés, les autres sont indemnes ; il en est ainsi de l'épilepsie.

Le père et la mère n'ont jamais été épileptiques, l'enfant aura été conçu dans des conditions défectueuses, ce n'est plus de l'hérédité vraie.

Le second caractère de la grande épilepsie avec malformation éclatant entre la 12e et la 20e année, c'est que le premier "insultus" égale le dernier. Les accès peuvent se multiplier, mais ils restent identiques. Aussi l'attention du médecin ne doit-elle pas porter sur l'intensité insignifiante des attaques, mais sur l'état de santé des malades dans les intervalles. Les autres étaient devenus épileptoïdes à la suite d'une maladie du cerveau, ceux-ci deviennent malades du cerveau à la suite de l'épilepsie.

Troisièmement l'épileptique n'engendre pas d'épileptique : c'est l'exception rare. J'ai été souvent consulté sur les conséquences du mariage avec un épileptique ; j'ai toujours résisté à ces unions, mais, consulté sur la question de savoir si les enfants à naître étaient fatalement condamnés à l'épilepsie, j'ai répondu non, et pas une fois ces unions n'ont donné naissance à un enfant épileptique.

Quatrièmement, l'épilepsie vraie, par malformation, n'admet pas d'aura prémonitoire. L'attaque est instantanée, foudroyante, la perte de conscience immédiate. Tout malade averti de l'attaque imminente est un épileptoïde.

Cinquièmement, aucune influence quelle qu'elle soit, morale ou physique, ne peut provoquer l'attaque, elle survient à son heure et n'a à compter ni avec la santé générale, ni avec les indispositions accidentelles. Une seule condition semble provoquer le retour des accès : c'est le sommeil ; encore n'agit-il qu'aux dernières heures de la nuit ou aux premières heures du matin, dans le passage du sommeil à la veille. Tout homme, pris d'une attaque dans le passage de la veille au sommeil, est éclamptique, mais non épileptique.

Ce fait clinique n'est pas sans importance. J'ai dû me borner à ces courts aphorismes devant un auditoire si compétent et auquel les occasions ne manquent pas pour en vérifier l'exactitude, et je vous remercie de votre bienveillante attention.

Testamentary Incapacity.

Dr. Bucknill, London.

As our colleagues from the Continent may not be aware of the differences which exist between our laws and theirs on the subject of wills, testaments, or bequests, I will premise my observations by mentioning : First, that with us a sane man may will or bequeath the whole of his possessions to go after his death to whomsoever he thinks fit. Secondly, that he may do this without the assistance or intervention of any notary or other official person. And thirdly, that the rules by which the validity of the will is determined are fixed not by any system or code but by precedents afforded by the decisions of the Courts themselves. In this manner the same authorities both make and administer the law, and it so happens that in this subject of testamentary capacity the law has been remade and as I venture to think upon fallacious arguments and upon deceptive grounds.

The old law of England was that an insane man cannot make a will. Then necessarily came the question, Who is an insane man in this regard? and much thought and learning were devoted by the principal minds of our most eminent legal authorities to the proper answer. Omitting on this occasion any reference to incapacity for want of mental power, I shall restrict myself to the consideration of the point in which the law has been altered by a comparatively recent decision—namely, in the point of the influence of insane delusion.

Unfortunately I cannot get at the subject without reference to the metaphysical arguments which have been employed by our great lawyers. It had been argued by Lord Chancellor Brougham, presiding over the ultimate Court of Appeal in our House of Lords, that because the mind is one and indivisible therefore an insane delusion affected the mind as a whole, and consequently that every act of a person suffering from an insane delusion was an insane act. On this principle any testament made by a person suffering from any insane delusion had been considered invalid so long as the case of Waring *v.* Waring, was looked to as deciding the law on the subject. However in 1871 the Lord Chief Justice of England presiding over his own Court of Queen's Bench as a Court of Appeal changed all that.

It is to the facts and the arguments contained in this leading case of Banks *v.* Goodfellow that I particularly desire to draw your attention. I will, in the first place, read the description of the testator, as given by the Lord Chief Justice:—"It is a fact beyond dispute that the testator, John Banks, had at former times been of unsound mind. He had been confined, as far back as the year 1841, in the county lunatic asylum; discharged after a time from the asylum, he remained subject to certain fixed delusions. He had conceived a violent aversion towards a man named Featherstone Alexander, and notwithstanding the death of the latter some years ago, he continued to believe that this man still pursued and molested him; and the mere mention of Featherstone Alexander's name was sufficient to throw him into a state of violent excitement. He frequently believed that he was pursued and molested by devils or evil spirits, whom he believed to be visibly present. Besides these delusions, which were spoken to by two witnesses whose evidence was above suspicion, the one a medical man who attended him from 1856 to the end of 1862, the other the clergyman of the parish in which the testator resided, there was a body of evidence, which, if believed, was strong to establish a case of general insanity. The jury, however, found in favour of the will, and therefore must have believed this evidence to have been greatly exaggerated, or must have come to the conclusion that the will was made during a lucid interval. From September 1873, he had a succession of epileptic fits, and a blister was applied to his head, and the medical man who attended him throughout this period, deposed that his mental power, such as it was, suffered from the fits, and that he considered him insane, and incapable of transacting business during the whole time." The will was made in December, 1863.

The Lord Chief Justice goes on to describe the manner in which the will was prepared and executed, from which it is apparent that the testator knows what he was doing, so far as a knowledge of his possessions went, but which throws no light upon the motives which influenced him in disposing of them.

The will itself contained no intrinsic marks of insanity; neither is it a document demanding for its production such an exercise of sound judgment as to constitute evidence of mental power and capacity.

Now, in considering the above descriptions I think you will agree with me that the mental condition of the testator was erroneously considered in the Courts as one of partial insanity or monomania. It seems to me clear that it was one of the mania of persecution, and, therefore, that the judgment of the Court of Queen's Bench, which is the existing operative of the law relating to testamentary incapacity, has been founded upon arguments relating to monomania upon a case which was not monomania but the mania of persecution.

I do not think that any of my learned, experienced, and interested audience will

concur in the opinion of the Court of Queen's Bench that John Banks as describe by the Lord Chief Justice was capable of making a valid will, but putting aside the question of false diagnosis in the particular instance, let us assume that the case was that which the Court of Queen's Bench believed it to be, and briefly examine the reasonings applied to it in that supposition and the conclusions to which they led.

The Judicial Committee of the House of Lords in that judgment in Waring *v.* Waring, which was the leading precedent up to the time of the judgment in Banks *v.* Goodfellow had declared that the mind being one and indivisible it was improper to speak of the delusions of monomania as affecting part of the mind. The Court of Queen's Bench on the contrary declared that the mind like the body being composed of a number of separate and distinct organs and faculties, any one of which might be and often was affected separately and exclusively, it was correct to speak of some cases of insanity as affections of part of the mind. And here I must observe that all these great authorities speak of the mind as if it were some distinct entity, whereas the only exact and correct way, is to speak of a man's mind as the whole mental quality of each individual man. Now I venture to assert that a man's mind, my mind for instance or your President's mind, is not a bundle of distinct faculties, but that it is the whole mental activity of each man, his whole sensory and cerebral activity inherited and acquired, and that if we examine any mental activity which may on slight consideration seem distinct, we shall find it really involves the activity of a man's whole mind. Let us not despise these metaphysical or more strictly speaking psychological questions, for in medico-legal questions relating to insanity they cannot be easily evaded, for the lawyers' inquiries are always how a man thinks and desires to act, and not how it happens that bodily conditions influence his thoughts. It is our experience as bearing upon beliefs as they influence action, and not our physiology as bearing upon mental activities that is so useful in the great administration of the law.

But what is a delusion? The Court of Queen's Bench either used language very carelessly or it considered a delusion to be a faculty of the mind, seeing that it spoke in this judgment of "delusions and other faculties of the mind." Without stopping to refute this curious notion we may remark that a delusion being a false belief caused by mental disease implies the activity of a man's whole mind as much as any true belief implies such activity. If I were to believe that this room was full of skeletons I should have to construct almost as complex an idea as I have to construct in believing it to be filled with living men. Therefore a deluded man is not insane in part of his mind, and the French law which permits the Courts in that country to invalidate part of a man's will because it may seem to be made by the insane part of his mind, and to establish the remaining part of the will as if it were dictated by the sane portion of mind is only carrying out to the extreme the principle of our own Courts. This at length is the root of the whole question or rather the tap root for there are many divergent fibres. For my own part I cannot believe that a lunatic with active and operative insane delusions can perform any acts as a reasonable man. He may no doubt do many things which have all the characteristics of reasonable actions. But the quality of the actions does not convert a lunatic who leaves a reasonable will into a reasonable testator, any more than the success of that painter who throwing his brush at the canvas produced a sublime effect thereby proved him to be a great artist. The more tenable theory of the law would be that partial insanity, is the insanity of a man's whole mind on a particular subject or subjects, leaving the man's whole mind free to form reasonable

judgments and to be guided by healthy and right feelings and motives in other subjects. Our experience would in exceptional instances confirm this theory, but I do not think it would confirm it to the extent it has been stretched to by our existing law either in its application to criminal irresponsibility or to testamentary incapacity, for in one case to satisfy the lawyers the delusion must have been upon the subject of the crime and in the other case it must have been upon the matter of the will. Our experience would I think lead us to declare that in the great majority of cases active delusion upon one subject or class of subjects is sufficient proof that the man is incapable of exercising his judgment, controlling his feelings, and directing his conduct rightly and reasonably upon any subject, or at least that he cannot be trusted so to do.

This view was not unknown to the Lord Chief Justice who remarked in this judgment—"It is said, indeed by those who insist that any degree of unsoundness should suffice to take away testamentary capacity, that where insane delusion has shown itself it is always possible, and indeed may be assumed to be probable that a greater degree of mental unsoundness exists than has actually become manifest. But this view, which is by no means universally admitted, is unsupported by proof, and must be looked upon as matter of speculative opinion" (p. 570). I do not, however think that I have derived my belief in the extension of the influence of delusion beyond the range whence it is generally manifest from speculative opinion. I believe that I have obtained it from the observation of facts, however, that are not capable of such proof as the Lord Chief Justice would have demanded, facts like weather facts which he as a seafaring man would have observed and believed, but which he could not easily prove. But having sufficiently criticized the mistaken and misleading arguments which constitute the grounds of the precedent upon which the law of testamentary capacity is administered in this country, may we not be asked whether our knowledge of the phenomena of insanity, will enable us to afford any sure guidance for those engaged in the actual practical duty of determining what wills ought to be established and what others ought to be invalidated on account of insane delusion? It is not for us to decide upon the amount of mental health power or completeness which shall enable a man to make a will, for the community might if it so thought fit decide that it should be law that any and every will made by a lunatic should be valid. What we have to do as witnesses of special experience is to assist the Courts in determining how the facts of nature come within the principles of reason which are, or are supposed to be the laws on this as on other subjects.

We cannot do better than quote the clear principles laid down in this judgment as to the mental power or completeness needful to testamentary capacity. "It is essential," says the Lord Chief Justice, "to the exercise of such a power that the testator shall understand the nature of the act and its effects; shall understand the nature of the property of which he is disposing; shall be able to comprehend and appreciate the clauses to which he ought to give effect; and with a view to the latter object that no disorder of the mind, shall poison his affections, pervert his sense of right, or prevent the exercise of his natural faculties—that no insane delusion shall influence his will in disposing of his property and bring about a disposal of it, which if the mind had been sound, would not have been made" (p. 565).

It is clear that under this ruling if an insane delusion has any effect whatever upon a man's mind at the time he makes his will the testament will be invalid. But if I understand the judgment aright it was ruled that in order to invalidate a will by proof of delusions, it was needful to show that the delusion was likely to

have an effect upon the will, and it was certainly argued that very pronounced delusions might and frequently did exist without such influence.

I venture to suggest that the rule ought to have been put the other way, namely that the proof of an insane delusion should necessarily invalidate a will unless it were shown that the delusion was of such an exceptional and peculiar nature that it did not and was not likely to have effected the will. This is the relation of delusion to action which Mr. Justice Stephen has contended for, in its bearing upon the criminal law. He mentions that in the trial of offenders a delusion having been proved, the burden of proof should be shifted to the accuser to shew that the delusion was not influential in the causation of the offence. And so also it should be in the Probate Court—that if an insane delusion be proved, it should be incumbent upon the party propounding the will to establish the fact that the delusion could not in any way have influenced the disposition of the property, either by its effect upon the testator's affections, or upon his sense of right, or by affecting in any way the natural and healthy exercise of his mental faculties.

But are there any delusions so uninfluential upon conduct or rather upon the particular conduct of will making? I think there are, and that it is our duty to discriminate them. Hypochondriacal notions are an obvious example of delusions which rarely affect the conduct of the sufferers towards others, so that it might be well maintained, that a man could make a will notwithstanding that he had refused food, because of a delusion that he had no passage through his intestines; while another man who had refused food under the delusion that he was ruined and could not pay for it, could not make a will.

Great care and caution ought to be exercised with regard to all kinds of delusions on establishing the fact that at the time of making the will there existed such an active state as to influence conduct. I do not intend by this to endorse what appears to me to be somewhat of a quibble of the courts about active and latent delusions upon which much legal ingenuity has been expended. By a latent delusion the lawyers mean a delusion upon any subject upon which the man is not thinking about at the moment. For instance John Banks was not always thinking about Featherstone, and then his delusion was latent; but the mention of Featherstone's name made the delusion active and threw John Banks into violent excitement. This is not at all the kind of latency to which I attach importance. That mental state of which I wish to speak as the result of my observation is, that in a certain number of cases, delusions which at one time, would clearly invalidate a will because they would inevitably influence its provisions, become after a time so sluggish and imperative that they do not in any way influence conduct. So much so is this the case in some instances that I have had to raise the question in consultation as to cure and treatment—Is all this we have heard an existing delusion or the mere memory of a delusion? And sometimes I am convinced that a patient will talk from mere memory in the most deceptive way about old delusions which have really passed. If one man can deceive by hiding delusions which exist, another will sometimes describe delusions which are only remembered as delusions which are existent. But the more important cases in reference to our subject, are those in which old delusions have faded but not disappeared; their continued existence being so weakly that they are quite inoperative upon conduct. I do not know how often a man's mind becomes as clear and strong after an attack of delusional insanity as it was before, but I am sure that there is very often a cicatrix which it is one's duty to distinguish from an open wound. The Genesis of Delusions has been especially studied with accuracy and philosophic

insight by our French colleagues, but the Exodus of Delusions is a field of research which has not yet received a thorough investigation. Although in regard to our present subject, and also in regard to other questions affecting the insane, it is a matter of the highest importance. When however, the Exodus of Delusions comes to be written, a fact most important in its bearing upon our subject will have to be stated; that although the intellectual delusion may have faded, the perverted feelings excited by the delusion, or which were concomitant with the delusion in its active state, may remain as intense as ever. And testamentary injustice is more likely to arise from personal antipathies founded in delusions which have passed, than from weak and faded intellectual delusions which may still exist.

But I must conclude with the feeling that I have only opened the first parallel against this stronghold of error and injustice, for the probate of wills in this country has been transferred from learned and thoughtful judges to the decision of juries, who are certainly not always able to appreciate the questions before them; and the more that under bad law the Court needs the assistance of experienced and competent witnesses, the less is their aid invoked. Under the old law when the probate of a will depended upon the simple fact of insanity, a well-instructed judge might not find the satisfactory discharge of his more simple duty too difficult. But now that the probate or the rejection of a will, depends upon the degree of insanity and the influence of delusion, so that the question before the Court is rendered vastly more complicated, and the administration of justice greatly more difficult, decisions as to the ownership of commons, and accounts of property are habitually arrived at, under a precedent of laws which seems wrong in almost every respect—wrong in fact, in argument, and in principle; and by procedure which the constant occurrence of compromise and settlement out of Court indicates as precarious and untrusted. Instead of being settled by judges, such as Sir John Nichol who brought great learning, philosophical habits of thought and intimate acquaintance with the subject to bear upon his decisions, the probate of wills is now left to what is called the common sense of juries which in recondite questions too often means common ignorance; and these juries are led by a bar of extraordinary technical skill and power—skill and power, that is, in the art of leading such juries. One cannot read any of the great judgments in lunacy without perceiving how recondite the questions and matters involved must be. One cannot witness an actual lunacy trial before a jury without perceiving the low level to which all arguments are purposely brought, and a low trajectory—a great merit in a rifle—is scarcely such in an argument. It would be social treason to doubt the competency of our own jury system to the decision of any question which can be litigated, but Lord Chief Justice Cockburn seems to have perceived that such a doubt might arise, since he gave himself the trouble of answering it. "Such an inquiry, [whether delusion has not affected the general faculties of the mind], may involve, it is true, considerable difficulty, and require much nicety of discrimination, but we see no reason to think that it is beyond the power of judicial investigation and decision, or may not be disposed of by a jury directed and guided by a judge." The Judge of the Probate Court enjoys the very highest reputation for all the qualities which make a judge illustrious, but he administers a different law to that which was administered by his immediate predecessor, Lord Penzance, and he was himself one of the legislators who made that law by the judgment in Banks *v.* Goodfellow. Moreover from time to time he must feel that juries will not allow themselves to be directed and guided by a judge, in the application of a precedent, which opens the door to various considerations which the stricter rule of the superseded law did not

admit. I think the first thing which drew my attention to those matters was hearing the President charge a jury against a will, which was certainly made by a lunatic, which the jury well established against the evidence, and notwithstandingthe charge.

Perhaps there is no Court in which the aid of science and experience is more needed than in the Probate Court, probably there is no Court in which they are less invoked. Compromises and the rule of thumb prevail.

DISCUSSION.

Dr. MACDONALD, New York: stated that much difficulty of the same kind had arisen in the United States: he related an interesting case, where a Frenchman, under the influence of a belief in metempsychosis made a will in favour of animals, which was sustained, on the ground that metempsychosis was a religious system, and not a delusion.

Dr. MAUDSLEY, London: expressed his surprise at hearing Dr. Bucknill maintain that a person suffering from monomania should be debarred from making a valid will. The Lord Chief Justice, in his ruling, only followed in the lines of certain decisions given by one or two of the leading American judges; and it had always seemed to himself that a genuine advance had been made in that case. If the will were such an one as a perfectly sane man would have made, surely it should not be upset because of some delusion.

Dr. WOOD, London: agreed with Dr. Maudsley, remarking that there were many persons in private asylums who were perfectly capable of making wills.

Dr. ORANGE, Broadmoor: believed that the main advantage of the Lord Chief Justice's decision was that it took the question out of a groove, would cause each case to be dealt with on its own merits, and would necessitate the advice of skilled experts.

Dr. BUCKNILL, in reply, said, that, as to whether a will was a proof of insanity, Lord Penzance had declared that a will could scarcely be conceived which would carry in itself the proof that it was not written by a lunatic. The dispostions of a will might be so reasonable as to afford evidence that it was a reasonable will, but as in cases reported this might be unreliable. The particular will in question clearly carried in itself no proof of reason. It was an unnecessary will. It left the property to the heir. With respect to what had been commented on as to the capacity of patients in asylums to make wills, he for one was not at all disposed to dispute it. Not long ago he was called to see a patient in a private asylum for the purpose of making an affidavit for an inquisition. He found the patient quite well. The patient said he wished to make a will, and he, Dr. Bucknill, saw no reason why he should not do so, and he expressed that opinion. He understood that, not long afterwards, the patient was taken out of the asylum to the office of the family solicitor; that every precaution was taken to ascertain his sanity at the time, and the patient made a will that same day. He believed there were many patients in asylums who were competent to make wills. On the other hand he thought there were many persons outside of asylums who were not competent to make wills. He had little more to say except that he much regretted that no notice had been taken of that which he had considered as a most important point in his paper—viz., the part wherein he fully expressed his opinion, which he was afraid was not quite understood, that in certain cases of restricted delusions wills might be made, only it ought to be shown that those delusions had no influence upon the will, and the burden of proof ought to be thrown upon the persons who wished to establish the will. He also wished that a discussion had arisen upon the point that a delusion which might, in an active state, have very likely caused such a condition of mind as to render the deluded person incompetent to make a will, might become, after a time, so mitigated that the delusion would be quite inoperative, not affecting his conduct in any way.

Treatment of the Prodromal Stages of Insanity.

Dr. Otto Müller, Blankenburg am Harz.

Dr. Otto Müller delivered an address upon the "Treatment of the Prodromal Stages of Insanity," of which the following are the heads:—

1.—Die Psychiatrie hat die klinische Behandlung der Prodromalstadien der Psychopathien als das Object ihrer Thätigkeit anzustreben, und darf nicht, wie bisher, nur die entwickelten Psychosen in Anstalten behandeln.

2.—Sowohl wissenschaftlich als practisch ist die innige Vereinigung der Psychiatrie und Neuropathologie anzustreben, der Isolirung der Psychiatrie dadurch entgegen zu arbeiten, und ihr ihre volle segensreiche Thätigkeit zu sicheren.

3.—Es ist die psychiatrische Bildung des practischen Arztes und die Begründung offener Curanstalten für die Prodromalstadien ein dringendes Bedürfniss der Gegenwart

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The following papers and abstracts, owing either to want of time or the absence of their authors, had to be taken as read. They are placed in the alphabetical order of the writers' names.

On the Race-Relationships of General Paralysis.

Dr. Ashe, Dublin.

If one of the medical staff of an English asylum were to visit an asylum in Ireland there is probably no feature which would strike him as being in more marked contrast with those familiar to him in England than the absence of general paralysis among the inmates.

Accustomed to see from 3 to 12 per cent. of his inmates suffering from this disease, and to recognize its presence in perhaps 10 per cent. of his admissions, or sometimes even more, while of his deaths, 20, 30, 40 per cent., or even more, are due to this cause, he may absolutely examine one asylum after another in Ireland without finding a single case of it.

The late Dr. Robert Stewart, for forty years physician-superintendent of the Belfast asylum, for that town and the county of Antrim, informed me that during that period he had not seen a single case of the disease. His successor, Dr. Merrick, has a similar experience. In 1875 in answer to some inquiries of mine on this subject, he wrote, "We have no case of general paralysis in the Belfast asylum at present." In answer to the questions now proposed by the committee of this section, and referring to the answer he then gave, he writes, "I have had no case since." This asylum has an average of 440 inmates drawn alike from the agricultural population of the county Antrim, and the largely manufacturing population of the towns of Belfast, Lisburn, &c., the former having a population of about 200,000.

The Cork asylum contains about 800 inmates, drawn like that of Belfast from a large agricultural population, and a town population of about 100,000. In 1875, Dr. Atkins then assistant-physician writes, "one spurious case at present in the asylum." At the same date, Dr. McCabe, then physician-superintendent of the central criminal asylum at Dundrum, near Dublin, writes, "I regret that there are no materials here; I have not had a case of general paralysis since I took charge, three years ago." This asylum, containing on the average 180 inmates, has now been for over five years under my charge, and in all that time I have had but one case of the disease, a very well

marked case occurring in a male; there is, however, another case in a female which I regard as one of arrested general paralysis, exhibiting the optimism, the fat condition of body, heavy face, occasional outbursts of violence, and, now and then, a slight tripping of the tongue, not perhaps to be recognized by an ordinary observer; but for five years this case has made no progress.

During three years that I was superintendent of the Londonderry asylum with 250 inmates, I had but two cases, both well marked and typical, and both males.

It has even been hinted that in Ireland we do not know the disease when we see it. That this charitable view is not correct, may be shewn by the extract from a letter from Dr. Petit, superintendent of the Donegal county asylum at Letterkenny, containing about 300 inmates, drawn from an agricultural and sea-board population; he writes in reply to the queries of this section. "Since I took charge of this asylum, I have not had a case of general paralysis, that takes in a period of six years; while assistant in Richmond asylum, Dublin, I was quite familiar with the symptoms of the disease."

The Richmond is the largest asylum in Ireland, containing over 1,000 inmates, drawn from Dublin and its suburbs, and the towns of Dundalk and Drogheda, giving a town population of about 320,000, and from the otherwise almost pure agricultural counties of Dublin, Wicklow, and Louth. Dr. Lalor's annual returns shew also that this asylum presents the disease in a proportion quite exceptional for Ireland, the number of cases treated for it during each year averaging from 2 to 3 per cent. of the number of male inmates, usually between 400 and 500. The cases occurring among the female inmates, however, are often nil, and do not appear ever to reach so high as ·2 per cent. on an average of over 500 females.

It will also sometimes happen that an Irish asylum will exhibit a number of cases much in excess of what will at other times be found in it. Thus the Cork asylum of 800 inmates, reported free from the disease by Dr. Atkins in 1875, is now reported by Dr. Eames as having five cases, all males, or about 1¼ per cent. on the male, inmates. In Omagh, out of 300 male patients there are two general paralytics.

In Clonmel, out of 200 males, Dr. Garner reports one case only. In Killarney Dr. Woods, who, as having been assistant in an English asylum, must be fully acquainted with the disease, reports one doubtful case out of 186 male patients.

In Limerick, with 235 male inmates, Dr. Courtenay, who is similarly qualified by English experience, reports no cases. Nor has Dr. Daxon any at Ennis, out of 135 males, but he says one died in Jannary last. Thus the disease is known, indeed, and its recognition unquestionable on its being seen, but its occurrence is rare to an extreme degree as contrasted with what is known in asylums in England, Wales, or Scotland, at least in its large town populations. The question whether it is to the predominance of Celtic blood that Ireland owes its immunity is one of much interest, and that not of a theoretical or speculative character only; for undoubtedly the determination of the cause of so well marked an immunity as this must approach very nearly to a determination of the cause of the disease where it is commonly prevalent, and the bearing of this on preventive measures, and curative treatment, is at once obvious.

In investigating this question, it is necessary to guard against an error regarding the inhabitants of Ireland which is only too prevalent in England, that, namely, of ignoring any community of race and blood between the two countries, and regarding those who live west of St. George's Channel as being Celts, pure and simple, and without any substantial exception. That all who have been born and live in Ireland are *pro tanto* Irishmen, is a proposition hardly to be denied. That all Irishmen are Celts, is a proposition universally maintained in England, but widely at variance with actual fact. As well might it be asserted that the Irish population of Liverpool have, by virtue of their residence in that town, become Saxon. The blood of the Saxon invaders of Henry II's time, has, indeed, become thoroughly mingled with that of the Celtic aborigines, so that the race elements can no longer be differentiated; but the settlers of the reign of Elizabeth, the Ulster plantation colonists of James, the Scotch lowland

occupants of the same province, and the Cromwellian settlers, appear, owing to the combined antagonisms of race and religion, to have refrained almost entirely from intermarriage with the Celtic Irish, and are to this day readily distinguishable, not only by the obvious test of religious denomination, but even by their type of face and physiognomy. I am, I think, correct, in regarding the lowland Scotch as being in the main Saxon. Certainly this is the view taken by Sir Walter Scott, than whom there could be no higher authority, where he makes the Highland chieftain, Roderick Dhu, address James V. as a Saxon, and speak of the Lowlanders as his own foemen and of that race.

"Now, gallant Saxon, hold thine own."

And again,

"No, by my faith, while on yon plain
The Saxon rears one shock of grain."

The English, again, are spoken of by Fitzjames as Normans. Hence, I think it is to be considered that the Lowland Scotch element so widely distributed over Ulster, and which is quite recognizable by its adherence to the national creed of Scotland, is a Saxon element of population, of blood perhaps as pure as the English element undoubtedly is. Hence I think we must hold that, in the counties of Antrim and Down, where the population is about one-fourth Catholic, and three-fourths belonging to some denomination of Protestantism, we have, in fact, a much larger Saxon element than is to be found in Wales, Cornwall, or the highlands of Scotland: In the other counties of Ulster the proportion of Saxon and Celt will probably be about equal. In the province of Leinster the proportions will probably be reversed; while those of Connaught and Munster may be regarded as being, to all practical interests and purposes, purely Celtic.

Examining in view of these considerations, the statistics with which we have been furnished, we find, contrary to what might have been expected, that it is actually in the most thoroughly Saxon districts of Ireland, that the immunity from general paralysis is most strongly marked; that is to say, in the county of Antrim, for it was in the Asylum of this district, that of Belfast, namely, that Dr. Stewart, as above mentioned, found a complete immunity from the disease, during a 40 years' tenure of office, and that his experience has now been confirmed by his successor, Dr. Merrick, during six years thereafter. And this is the more noticeable in view of the well-known proclivity to the disease presented by a town population so large as that of Belfast, and 200,000, and one moreover much engaged in manufacturing and marine occupations. On the other hand it is in the Richmond Asylum, where fully four-fifths of the inmates are of Celtic blood, that general paralysis has, as regards Ireland, its especial home. Small as are the numbers affected with this disease in the Richmond as compared with those to be found in an English Asylum, it is yet to be borne in mind that, as regards Ireland, they exceed the average in the proportion of about 6 to 1. This is arrived at by comparing the numbers returned as affected with the disease in the different asylums; for of the numbers dying from it in any year, I have no account, even from the Richmond; nor do the Tables of the Irish Inspectors contain any head for this disease; neither does their Annual Blue Book refer or allude to it. As regards my own undoubtedly rather limited number of cases, in Londonderry Asylum, where the population was about half of Saxon, and half of Celtic blood, I had one case of each during three years. In my present Asylum, the State Asylum of Ireland, where the proportion of races, drawn from the whole of Ireland, is about 85 per cent. of Celtic blood, and 15 of Saxon, both my cases have been Celtic.

Let us turn now to the consideration of other parts of the United Kingdom, in which Celtic blood is known to predominate. Monmouthshire, though an English county, is largely inhabited by people of Celtic race, while Brecon and Radnor are Welsh; the Superintendent of the Joint Counties Asylum at Abergavenny, however, states that the races are so intermixed that it is impossible to assign the proportion of each. However, out of 283 male inmates, he returns 18 as affected with general

paralysis at the present time, and 5 females out of 270. That is to say, about 6·3 per cent. of the male patients, and about 2 per cent. of the females. The Commissioners' Report of 1875, gives 21 per cent. of male and female deaths together as due to this disease. In view of this return I think it must be admitted that Celtic blood has not done much towards protecting the people of these three counties from the disease.

Turning next to Glamorgan, the superintendent, like many others to whom application was made, found himself unable, from press of work, to fill up the returns sent by the Section; but on examination of a couple of the Annual Reports of the Asylum, we find—First, that he regards his population as essentially Celtic. Secondly, that of new cases admitted in the year 1879, 10 per cent. of the males were suffering from general paralysis; no females; and in the year 1880, 7 per cent. of the male cases admitted, and 1 female out of 61 admissions were thus affected. Thirdly, that, in 1880, 9 per cent. of male, and 13 per cent. of female deaths were due to this disease. In 1879, 15 and 7 per cent. respectively, and in 1878, as stated in the Report of the Commissioners in Lunacy, the deaths from it numbered 13 cases, or 18 per cent. on the total number of inmates. If, as is usually the case, the greater number of these deaths occurred on the male side, they will represent a mortality from the disease equal, perhaps, to the average of English Asylums. Again I think we must conclude that Celtic blood has not afforded much exemption to Glamorganshire.

The Statistical Tables of the Carmarthen Asylum are very peculiar, and, as in the case of Glamorganshire, I have been obliged to depend on them only for information. I presume we may consider the population to be practically entirely Celtic. From the Annual Reports of some years back, we gather that of male cases admitted, 4 per cent. in 1880, 10 per cent. in 1879, 3 per cent. in 1878, and 10 per cent. in 1877, and 12 per cent. in 1876, were found to be affected with the disease; and of female admissions there were 3, 5·5, and 3 per cent. similarly affected in the years 1877, 1878, and 1879, respectively.

As regards deaths, it appears that 10 per cent. of all deaths in 1874, 8 per cent. of male deaths in 1877, and 10 per cent. in 1880, were due to it. This proportion is almost exactly that of the State Asylum at Broadmoor, which, as drawing its population from the entire of England and Wales, may perhaps be taken as representing the average percentage of the kingdom.

The Welsh county of Montgomery sends its insane to the Asylum of the English county of Shropshire, and, as the Statistics are not afterwards kept separate, it is impossible to make any reference to the condition of this county as regards the subject of this Report.

There is not, perhaps, in the three kingdoms any Asylum which draws its inmates from a more purely Celtic population than that of Denbigh, its district comprising the counties of Denbigh, Carnarvon, Anglesea, Flint and Merioneth. The Commissioners report, in 1875, the deaths from the disease to have been over 25 per cent. of the total male deaths, and 11 per cent. of the total female deaths. In view of the statistics above presented, I think we are forced to the conclusion that, at least as regards the Cymric division of the Celtic race, there is no exemption whatever from the ravages of this disease.

In the county of Cornwall there is, as is well known, a great preponderance of Celtic blood among the lower orders of the population; the exact proportion I am unable to estimate, no return having been made in reply to the circular sent out by the section. The reports of the Lunacy Commissioners are, therefore, the sole basis of information regarding the statistics of general paralysis in this country. We find that, in 1875, 10 per cent. of the total male deaths, and 4 per cent. of the total female, were due to it.

In 1876, the figures were 7 per cent. of the total mortality, that is without distinguishing the mortality of the sexes.

That is without distinguishing the mortality of the sexes.

In 1877, 16 per cent. of the total.

In 1878, the Commissioners do not specify the numbers.

In 1879, 14 per cent. of the males, and 5 per cent. of the females. There is here no ground for alleging that Celtic blood in Cornwall affords any exemption, any more than in Wales. Coming next to Scotland, the statistical tables of the Scotch Commissioners' Reports afford valuable information, as being based on the aggregate averages of many years. Their tables, however, refer only to Royal and district asylums, and do not include the statistics of parochial asylums or workhouses. Assuming that the view propounded above is correct that the southern counties of Scotland are essentially of Saxon blood, and the northern essentially of Celtic, it is difficult to come to the conclusion, from an examination of these Scotch tables, that race or blood, as such, has anything whatever to say to the prevalence of this disease, though it may, perhaps, in some degree, be influenced by differences in the nature of the occupations or general character of the died of the two races. Beginning with the lowest rate of mortality given in the tables, and proceeding to the highest, we find that the proportion of deaths from general paralysis on the total mortality was, in—

	MALES	FEMALES
Inverness	6·4	0·6
Elgin	6·6	2·9
Perth district	7·6	3.3
Roxburgh	8·6	—
Haddington	8·8	6·6
Perth Royal	11·1	1·7
Dumfries	13·1	3·3
Montrose	13·1	4·3
Midlothian	14·3	—
Argyll	16·2	2·0
Fife	16·8	0·9
Stirling	19.8	7·7
Glasgow	20·0	4·8
Banff	20·0	6·8
Ayr	22·1	—
Aberdeen	25·2	8.7
Edinburgh	25·3	7·0
Dundee	28·3	7·0

The general average for Scotland being 18·7 and 4·7, here we find that Haddington and Roxburgh, which are southern and Saxon counties, have a mortality from general paralysis amounting to about half that of Argyll, which is almost purely Celtic, and less than one-third of that of Aberdeen and Forfarshire, which are doubtless strongly Celtic also.

The replies furnished by Dr. Cameron, of the Argyll Asylum, to the question proposed by the Section show that, though about 80 per cent. of the population are engaged in agriculture and fishing, and only a very small percentage in manufactures, yet of 3 cases of general paralysis at present in the Asylum, this small proportion contributes 2, while only 1 is furnished by the agricultural contingent. Yet Ayrshire, with, I think, a purely agricultural population, is not far from the head of the list, at least, as regards male cases, with 22 per cent. of its total mortality due to general paralysis. The disparity between the large percentage of this county, and the total absence of the disease just across the channel in Antrim, with a population no less Saxon, and much more largely engaged in manufactures, and with such a town as Belfast in its midst, is certainly a very remarkable phenomenon and shows, I think, that we must look somewhere altogether beyond either race or occupation for the true causation of the disease, and the true account of its absence in Ireland.

It has recently been suggested, as is well known, that a syphilised constitution is the

true cause of the development of nervous disease into general paralysis; and certainly the country population of Ireland is remarkably free from this disease; but yet, against any general acceptance of this fact as accounting for the absence of this type of insanity in Ireland, the singular town of Belfast would seem to bar the way, for it cannot be supposed that a town of such a size, largely devoted to manufacturing and marine occupations, would present any such immunity from syphilis as would be required to maintain such a view, especially if contrasted with the agricultural population of Ayrshire just on the opposite coast.

The view has also been upheld that the immoderate use of alcohol, in one shape or other, is the cause of general paralysis; but it is well known that the Irish are not an abstemious people, as this theory would undoubtedly require that we should find them. The inhabitants of Belfast and Antrim drink as much as do those of Ayrshire and Glasgow, and moreover use the same form of intoxicating liquor. Indeed, the north-east counties of Ireland are much given to a still more rapid and pernicious mode of intoxication in the shape of ether-drinking, yet, general paralysis does not make its appearance, as on this theory it ought to do.

It would appear, therefore, that a careful examination of the statistics at our command eliminates from the causation of general paralysis the elements of race, syphilis, or venereal excess, and alcohol. To none of these elements can we point and say, this is different in Ireland, and therefore the disease is absent. There remains the question of diet. And here we at once find a marked difference of a national character. The potato in Ireland replaces the cereal food of England and the lowlands of Scotland. England eats wheaten bread; Scotland oaten; Ireland eats the potato. The question whether this can have anything to say to the exemption of Ireland from general paralysis is certainly worth experimental investigation.

It is well known that no element of diet has a more potent influence in the prevention of sea-scurvy than the potato. I have also observed, in the Londonderry Asylum, that just at the season of the year when the old potatoes can no longer be used, and the new ones have not yet come in, a sudden and marked fall in the vigour and vitality of the feebler patients. Those who were maintained in fairly average, though feeble, health then sank into an utterly prostrate condition and died. Observing this for two years in succession I afterwards kept potatoes specially for such cases, and, if at all practicable, never allowed the house to go on a wholly cereal diet, issuing potatoes three times a week even at their worst period, and since I have done so I have not observed the peculiar sinking of vitality at the period of the year referred to. It seems highly probable that the cereal diet of England and Scotland is a potent element in the energy and cerebral activity of the Saxon race as compared with the listlessness and indolence of the Celtic. But it would appear to be well borne out by the observations of English alienists that it is just the man of most energy and cerebral activity who is the most exposed to the invasion of general paralysis. It might be worth while to make experiments on the use of the potato, fresh vegetables, vegetable acids, with comparative abstinence from cereals, or a too largely nitrogenous diet, in the treatment of general paralysis in its early stages.

The Section have made inquiries regarding epilepsy in relation to race as well as regarding general paralysis. No reports or tables that I have seen appear to imply that there is any difference between the two races, or between the dwellers on the two sides of St. George's Channel in respect of this disease. The proportion of epileptics to the total number of inmates varies in Irish asylums from 2 per cent. to 16 per cent.; and the average of the whole of Ireland is 6 to 5 per cent. of males, and a fraction less of females. This is as regards males almost exactly the same as at Broadmoor which perhaps may be taken as presenting an average of the whole of England and Wales. The Broadmoor [illegible]entage of females is however only 2·6. The English reports and commissioners' [illegible] give the statistics of epilepsy only as a cause of death, not, in general, as affecting [illegible]r such a number of inmates. In exceptional cases, however, we find 12 per cent. [illegible] total number of inmates spoken of as a very high proportion, and probably the

average of England and Wales would be found to be not very different from that o Ireland.

A Paper on "The Chemical Investigation of the Urine and Blood of the Insane" was read by Dr. A. WYNTER BLYTH, London.

Psychophysical Researches on the Rapidity of Perception in the Insane.

Dr. BUCCOLA, Reggio (presented by Professor Tamburini).

Obersteiner parait être le seul qui se soit occupé de ce problème. Voici les résultats des nombreuses expériences que j'ai faites dans l'asile de Reggio avec le chronoscope de Hepp sur des malades de toutes les principales variétés d'aliénation mentale.

Chez les idiots, j'ai pu trouver, avec beaucoup de difficulté, que le temps moyen de réaction aux excitations acoustiques et tactiles est prolongé; et que la différence entre les plus hauts et les plus bas chiffres dépasse de beaucoup celle de l'état physiologique.

Chez les aliénés, il y a aussi un retard dans le temps physiologique; retard qui est d'autant plus marqué, que les malades sont plus affaiblis; et la différence entre les cas extrêmes est plus grande aussi.

Dans l'exaltation simple, la période de réaction est assez régulière, et s'approche de la normale; quelquefois même elle ne s'en écarte point. Mais dans ces cas, si le malade est très-distrait, on obtient des chiffres bien hauts.

Dans la lypémanie, la période physiologique moyenne est toujours élevée; et ceci provient de la préoccupation du malade par les idées tristes, qui l'empêchent de réagir promptement, car, lorsque l'on parvient à fixer son attention, les temps de réaction s'approchent davantage du normal. Les chiffres les plus élevés m'ont été fournis par un cas de lypémanie suicide.

Dans l'épilepsie simple, la pèriode de réaction est à peu près normale et régulière; mais, lorsque les attaques durent depuis quelque temps et se répètent fréquemment, les phénomènes se rapprochent de ceux présentés par la folie. Quelques heures après une attaque, le temps de réaction moyen est accru, et la différence entre les maximum et minimum est augmentée.

On Accidentally Induced Hypnotism.

Dr. J. MORTIMER GRANVILLE, London.

The point the author is desirous of bringing forward is the following: The several centres, or congeries of centres, composing the nervous system, are doubtless liable to be thrown out of their natural relations, while retaining their respective activities. This is well known; but I think we do not adequately recognize the facility with which this breaking of the normal relation may be brought about by means of excitants, acting continuously on some one special centre when the others are quiescent. I venture to suggest that, just as light may be polarized, so mind, in certain conditions, is liable to be "polarized"—as light may be disintegrated in the spectrum, mind may be disorganized; and this is, I think, what occurs in the "hypnotic" state. Any sensory excitant

may suspend the mutual relations of the nerve-centres, causing in ordinary cases nothing beyond exhaustion, stupor—ending perhaps in sleep. Some persons, from the loose organization of their nervous system, are specially liable to be thus disorganized; and such a person is, in the hands of a practised believer in hypnotism, "trained," intentionally or not, to the performance of certain definite processes. In particular, when the lower centres have been detached from their allegiance to the higher, they may fall under complete subjection to another mind. In the course of a prolonged investigation into the nature of sleep, I have found that there is a special liability to become hypnotized, when employing some of the means recommended to produce sleep. Such cases are very common among children and the old:—For instance, when an endeavour is made to set children to sleep by singing to them, setting a candle before them, &c., the state produced is not true sleep, but hypnotism. So, too, I have formerly found that a large number of insane patients, however violent, may be hypnotized by a sudden noise, a bright light, or other means of fixing the attention. The process seems to be nearly that by which Rarey trained his horses. I believe there is great peril of mental disorganization in all these cases, and that the peril is greatest when the hypnotic state is induced accidentally. I believe that religious ecstasy, and, in a lesser degree, religious "impressions" generally, are commonly accidental hypnotism, produced by fixed gazing into space, listening to a sermon, or to impressive church music, &c. In other cases I believe epilepsy to have been thus induced.

Sur le Traitement des Aliénés en Village.

Dr. Peeters, Gheel.

Je me propose d'insister surtout sur les rapports qui ont existé entre Gheel et les établissements fermés; et je montrerai que l'hospitalité accordée par cette colonie aux aliénés venant des autres asiles a été en grande partie l'origine du discrédit jeté sur elle. J'espère prouver que le traitement familial, loin de rendre service seulement comme refuge aux incurables, a une action curative remarquable. Pour résumer en quelques mots les services rendus par Gheel il suffira de remarquer:

1.—Que la population de Gheel s'est parfois élevée jusqu'au quart de la totalité des aliénés en Belgique; quelquefois elle est descendue au sixième; actuellement elle en est le cinquième;

2.—Que le tarif d'entretien a toujours été moins élevé que celui des établissements fermés;

3.—Qu'il n'a jamais coûté au gouvernement que 200,000 francs qui ont été consacrés à la construction de l'infirmerie; tous les autres agrandissements ont été payés par la colonie.

Les établissements fermés ont largement usé de l'hospitalité que leur offrait Gheel. Dans les vingt années de 1860 à 1880, sur un total de 5,310 admissions, 1,643—un peu moins du tiers—sont des transferts. Il a donc constamment reçu l'excédant des maisons fermées: et cet excédant se compose presque toujours d'aliénés qui ont passé des années à l'asile, pour qui tout espoir est perdu. Voici quelques chiffres pour les dernières années. En 1877, les malades transférés étaient incurables dans plus de 87 pour cent; en 1878 pour 78·2 pour cent; en 1879 le pronostic était fâcheux dans 90 pour cent. des cas. Enfin en 1880 les transferts réputés incurables montaient pour les hommes à 89, et pour les femmes à 79 pour cent.

Dans ces circonstances, Gheel a donné une proportion de guérisons, qui équivaut à 24 pour cent des admissions. Cette proportion est notablement inférieure à celle d'autres établissements Belges, mais en tenant compte des transferts incurables, il n'existe aucun doute que le patronage familial ne donne des résultats aussi favorables que les maisons fermées.

On Exophthalmic Goitre, and its Relations to Unsoundness of Mind.

Dr. G. H. Savage, London.

Three cases of completely developed Graves' (or Basedow's) disease, have come into Bethlem Hospital within the last few years. All three of these cases have been young women, and there was evidence of hereditary insanity (in two of them in the direct line) All the most recent suggestions for treatment have been tried, but without avail; two of the patients have already died, and I fear there is little doubt the third will soon follow. One case began, as far as was known, with exalted delusions and excitement; the other two were originally depressed, and had melancholic delusions; but in all there was a tendency to impulsive violence, to refusal of food, and to dirtiness in habits: the sexual functions seemed little or not at all affected. With these may be connected three other cases in which some of the symptoms of Graves' disease have been noted. In one, an instance of recurrent mania in a lady of twenty-one, most marked exophthalmos is present with each recurrence of excitement: this patient was most markedly benefited by hyoscyamine. In a second case, the symptoms are slowly developing; and in a third —a male of thirty-nine—the exophthalmos accompanies general paralysis, and his pulse varies from 100 to 150.

On the Proposed Italian Lunacy Law.

Professor Tamburini, Reggio-Emilia.

Un projet de loi sur les asiles publics, privés et criminels, a été récemment présenté par le ministre de l'intérieur au parlement italien, et y sera bientôt discuté. Jusqu'à présent l'Italie n'a pas eu de loi générale pour les aliénés; une seule province, la Toscane, en possédait une qui datait de 1838. Depuis longtemps cette loi a été réclamée par les aliénistes Italiens; et enfin, le ministre Cambelli en 1874, et Nicotera en 1877, ont présenté des projets de loi, qui contenaient (surtout le dernier) de bonnes prévisions, mais qui ne contenaient aucune disposition pour les aliénés criminels.

Le projet actuel a été préparé à la suite d'une commission nommée pour le préparer dont j'ai eu l'honneur d'être membre. En voici les principales dispositions :

Asiles publics et privés.

1.—Obligation pour chaque province d'avoir un asile pour tous les aliénés qui y seraient présentés;

2.—Chaque asile doit être autorisé par le ministre de l'intérieur, et placé sous la direction d'un médecin, qui ait déjà pratiqué dans un asile;

3.—Réclusion dans les asiles toujours autorisée par le pouvoir judiciaire (comme dans la loi Toscane); en cas d'urgence, l'autorité de sûreté publique pourra, d'après avis médical, ordonner provisoirement la réclusion;

4.—La réclusion ne sera considérée définitive qu'après un rapport constatant la folie, fait par le directeur de l'asile, rapport qui doit être envoyé à l'autorité dans la première quinzaine;

5.—Après un an de réclusion et un rapport du directeur, attestant que l'infirmité mentale est habituelle, l'*interdiction* devient obligatoire.

6.—Les mêmes dispositions sont applicables aux aliénés gardés par la famille;

7.—Pour les malades reconnus incurables et inoffensifs, obligation aux communes de les placer dans un asile de mendicité, ou de les confier à leurs familles ou à des personnes qui s'en chargeraient;

8.—La surveillance de tous les asiles sera faite par le ministre, qui nommera des médecins aliénistes inspecteurs, qui feront des rapports particuliers;

9.—*Asiles pour les aliénés criminels*—Ils seront établis aux frais de l'Etat. On y placera, d'abord les criminels devenus fous pendant la durée de leur punition, sauf les inoffensifs et tranquilles, qui pourront rester dans les prisons : aussi les accusés qui sont reconnus dangereux après avoir été absous pour cause de folie, et les accusés qui sont encore en jugement et qui ont besoin d'être gardés avec soin;

10.—Les criminels chez qui le tribunal (d'après la section 95 du code pénal italien) reconnaîtra une aliénation mentale qui n'enlève pas toute responsabilité, seront placés dans des " Case di custodia " particulières.

On the Condition of the Blood in Pellagrous Insanity.

Dr. Seppilli.

The author's observations were made upon fifty-five patients suffering from pellagra thirty of whom were females and twenty-five males. He confined himself to estimating the proportion of red and white corpuscles by means of Hoyem's apparatus, and the amount of hæmo-globin by means of the " chromocytometer " of Bizzozero.

The red disks were usually diminished in number, the number of white corpuscles being generally unaltered. The hæmo-globin was almost always deficient, and sometimes much below the normal. There is no invariable relation between the amount of hæmo-globin present, and the number of red disks.

These observations confirm the belief that, whether from the action of a specific poison or from insufficient food, notable changes occur in the blood during the course of this disease.

Moral Insanity.

Dr. C. H. Hughes, St. Louis.

Moral insanity, included in the term affective insanity, exhibits functional derangement in the affective rather than in the reflective faculties.

1.—If both are affected, then the intellectual is not primarily so, and no more than in ordinary passion.

2.—It is to be regretted, so far, the chief objection has been by assertion that it must be so-and-so; but we have to consider what we actually find. It does not follow that because these functions are united in health that they cannot be disassociated by disease.

3.—If the intellect is not diseased in the exercise of the emotions such as passions,

love, hate, &c., why may not some excess of these exist without intellectual perversion in the cases of affective insanity as seen after blows on the head, fevers, &c.

4.—The affective and the reflective functions are not directly related by development or in decay.

5.—Normal mind is the sum of the aggregate display of cerebro-psychic functions constituting the natural "ego;" abnormal mind consists of such disorder of one or more of the cerebro-psychic functions, as causes so marked a change in the natural psychical characteristics of the individual, whether principally involving the emotions and reasoning powers or will, as to make an inconsistency and inharmony in the person's character explicable only by disease.

6.—Generally, intellectual disorders exist with the affective, such as delusions; but it does not follow because one symptom is absent that the disease does not exist.

7.—Clinically affective insanity—moral insanity—does exist. The author protests against the metaphysical objections of the inseparable union of functions.

8.—Justification of the term, moral insanity.

9.—The non-recognition of the disease may be disastrous to the patients from legal points of view

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